THE IRON AGE

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A Later Day Type of Gray-Iron Foundry

Works of the Quigley Furnace & Foundry Company at Springfield, Mass.—Handling Heavy Materials—The Charging Floor and Its Service

The Quigley Furnace & Foundry Company, Springfield, Mass., manufacturer of gray-iron castings and the Quigley furnaces of various types, using coke, powdered or ordinary coal, gas or crude oil for fuel, is occupying its new foundry which is a fine example of what has been accomplished in recent years in the development of foundry building construction and foundry equipment. Of particular interest is the system for handling heavy materials and products, which has been worked out in careful detail. Manual labor has been reduced to a degree approaching that actually required in the processes of manufacturing. Traveling and jib cranes, an industrial railway and a monorail installation, act in combination to convey anything heavy from any one point to any other, not only within the building, but between it and the storage yard outside.

The foundry is a large one for its purpose—the manufacture of machinery castings of high grade, with castings made in dry sand molds for pumps, ice machines and similar purposes as a highly developed specialty. The two cupolas have capacities of 50 and 15 tons respectively. The building is 210 x 275 ft., of brick, steel and concrete, and fireproof throughout. The roof is of steel and concrete slabs, covered with tar and gravel, and so impervious to ignition that a bonfire, maintained upon it for an entire day failed to make any impression. As the illustrations show, a very large percentage of the wall area is occupied by windows and the high monitor provides ample overhead light as well as exceptional ventilation. The windows are of ribbed glass, which greatly reduces the temperature in warm weather and secures a much better diffusion of light as compared to plain glass.

The main molding floor, where the heavy work is done, extends the entire length of the building, and is 66 ft. wide. It is served by two 10-ton electric traveling cranes, and by two jib cranes equipped with electric hoists. The space devoted to light work is 35 x 215 ft. The coreroom has a 3-ton traveling crane. An industrial railway traverses the works, connecting the departments and acting as the carrying link between the interior cranes and that which serves the yard and charging floor. A monorail system of large capacity indicated in the general plan is to be installed in the near future.

The core ovens are of the Quigley type. Those for heavy work, two in number, are each 10 x 16 ft., and are arranged to fire with coke, powdered or ordinary coal or crude oil. The light work is cared for in a pair of Quigley furnaces of the reel type.

The cleaning room, adjacent to which is one of the exterior loading platforms, is admirably arranged and equipped to get rid of grit and dust. Exhaust tumblers are employed. The working floor consists of a steel grating below which is a subway reached from the outside of the building. All dirt falls through and is removed from time to time.

The charging floor in its combination with the yard in which pig iron, scrap, coke and heavy flasks are stored, presents perhaps the most interesting feature of the plant. Its level is 25 ft. above the ground, its area is 50 x 60 ft. Its construction is of the stoutest, consisting of 24-in. I-beams 50 ft. long, upon which are heavy iron plates. At one side are the two cupolas, with space for a third, which will be installed when the need for increased capacity shall be felt. On the other side are the hatchways in the floor, through which the sand bins below are filled, a task quickly accomplished by the crane which transfers the contents of a car by means of grab buckets.

The side toward the yard is open, excepting for an iron capped brick balustrade. The yard extends back 100 ft. and is 48 ft. wide, and is covered by a

10-ton traveling crane, the ways of which extend to the inner end of the charging floor. The larger cupola is served by a pneumatically operated charging machine. The skips are loaded in the yard, weighed for their charge, both on platform scales and by the crane scales, for purposes of checking, and delivered to the car of the charging machine. One man only is permitted on the charging floor under ordinary conditions. With the machine to help his individual effort has been found ample in keeping a cupola charged.

ELECTRICITY IN THE FOUNDRY

Lighting, Speeds of Crane Hooks and the Electric Tractor Truck Discussed

From a paper read by R. H. McLain of the Power and Mining Department of the General Electric Company, Schenectady, N. Y., before the Philadelphia Foundrymen's Association, February 4, the following notes have been taken:

The Yard from the Charging Floor of the Quigley Foundry, Showing Crane and Its Long Runway

FOUNDRY LIGHTING

For general illumination, a very powerful penetrating light is needed. The yellow flaming arc is considered best for this in large rooms where the lamps can be hung 20 ft. or over above the floor and the 500-watt Mazda in reflector covered with porcelain is best in small or low rooms and side bays. Yellow has a peculiar ability to penetrate the fumes and dust.

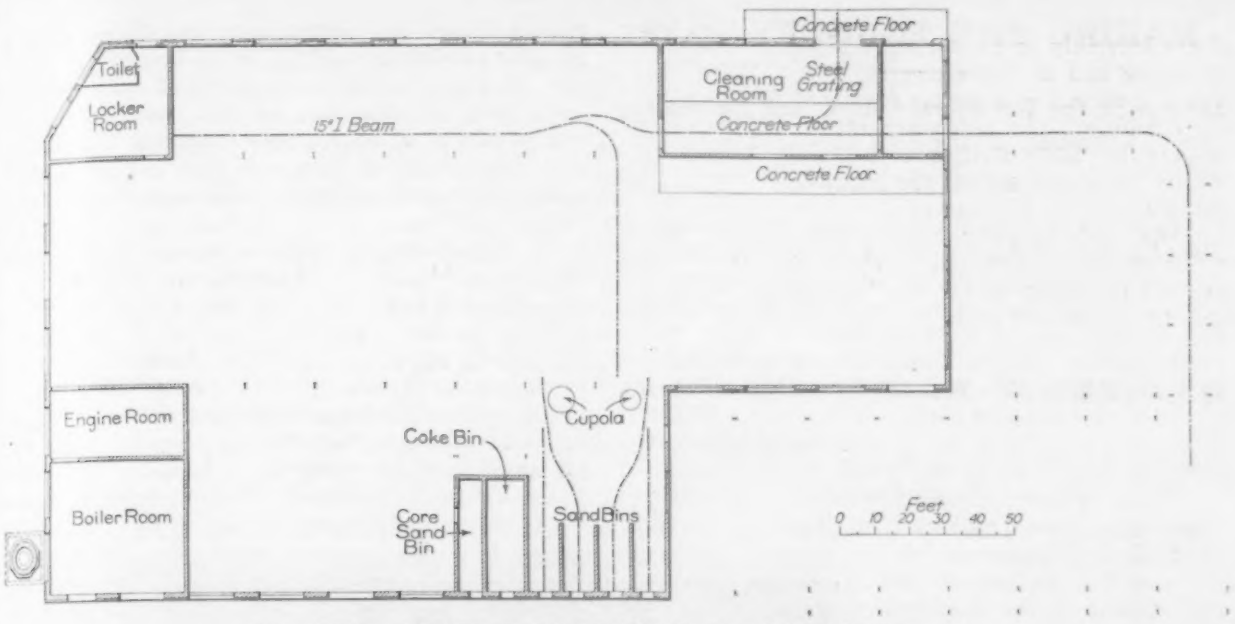
The lamps should be spaced symmetrically, but care should be taken not to make the illumination too even. Many units hung too high cause such an even or well diffused illumination on the working plane that the molders cannot clearly see the lines and curves of molds and patterns. It is, therefore, better where possible to use a few large units than many small ones. However, no general overhead illumination can take care of all requirements and it is wise to provide plugs at convenient places so that workmen may use small lights for working on the inside of molds.

CRANE HOOK SPEEDS

Hook speed of the crane is of vital importance. A careful analysis of the amount of work to be done and the delicacy of the operation should be made and proper speed determined from this. It is clearly evident that a locomotive geared to run at 60 miles per hour would not pull uniformly and slowly enough when drawing a thin pattern and this speed would be of no advantage in hastening the work. A speed of 40 ft. per min. has met with very general favor for 5-ton cranes and even 60 ft. per min. is in use in a merchant foundry where every conceivable kind of work is done. Fifteen ft. per min. is quite common on larger cranes. The only trouble with the higher speeds is that at times speeds of 1 to 5 ft. per min. must be obtained for drawing patterns, etc. With direct current it is not so hard to obtain this speed, whereas with alternating current it is very hard, unless the crane is geared for a slower speed than the direct-current crane, even though the best of cranes, brakes and controllers are used.

I know of a case where a crane is designed to take care of just one kind of work. It was at first thought that 40 ft. per min. hook speed should be used as a matter of course; but on investigation it was shown that 12 ft. per min. would do just as much work in a day and would give ideal control on delicate operations, whereas 40 ft. per min. would have caused a large percentage of lost molds. As mentioned above, direct current is better as regards creeping speeds than alternating current, but if the mechanical load brake is good and if the proper hook speed is used, there are few cases where it is necessary to go to any extra expense to obtain direct current if alternating current is the form in which power is generated.

In general alternating current is the best form in which to use power, because it is cheaper than direct current. On all other machines except the crane there is no doubt that alternating-current motors are better than direct current because nothing about them except their bearings is hurt by foundry dust, whereas direct-current motors must be enclosed on account of their commutators, if they are exposed to this dust. Any large continuous running machines like the air compressor may well be driven by a synchronous motor and they should be installed as far away from the dirt as possible. This



General Plan of the Plant of the Quigley Furnace & Foundry Company

type of motor can be made to have a leading power factor and thereby compensate for the lagging power factor of the induction motors which are used in other parts of the shop. This feature is especially valuable when central-station power is used or where the motors are installed at a great distance from the power station because it helps the line regulation and reduces the line losses.

In many places the storage-battery locomotive may be used. As a truck it may carry 20 tons, or as a locomotive it may develop 1000 lb. draw-bar pull. To economize on batteries and still have a large draw-bar pull, a low speed of 2½ to 4 miles per hour is used. Electric automobile motors with ball bearings and journals with roller bearings are used to eliminate friction and thus save the batteries. The weight of a locomotive is 10,000 lb.; the gross ton miles, 265; the charge requires 45 amperes at 133 volts for seven hours.

The Ferguson Steel & Iron Company, Buffalo, N. Y., which entered the steel jobbing and warehousing field on July 1 of last year, is doubling the size of its warehouse at Bailey avenue, Stanley street and the New York Central Railroad, at a cost of $12,000. It is making this part of the plant 165 x 200 ft. under roof, with a crane runway 485 ft. in length and 80 ft. span. James E. Ferguson, president of the company, reports that current business is exceedingly good and the outlook very favorable for a large increase this year.

Charging Floor of the Quigley Foundry

MAKING THE FOUNDRY PAY*

Increasing the Individual Output and Decreasing the Cost of the Iron Mixtures

BY STUART DEAN

Three points that make every firm's success seem to be carefully avoided by all writers and speakers on foundry topics. These points are:

1. Very capable assistants who insist on having only capable workmen under them.

2. Strong pressure from the manager brought to bear on these assistants, forcing them constantly to do their best, and

3. Allowing these assistants free hand; never handicapping them in the least.

I will repeat these three points: 1. Assistants many times more capable even than the manager himself. 2. Simple statistical reports that state the total amount of work turned out by each one of the departments, so that constant pressure can be brought to bear on the department heads. These reports will be total tonnage reports compared with total hours labor. 3. Department heads made to understand that since wonderful results are expected from them, they will be given free rein to make improvements, to drop poor men and put on better.

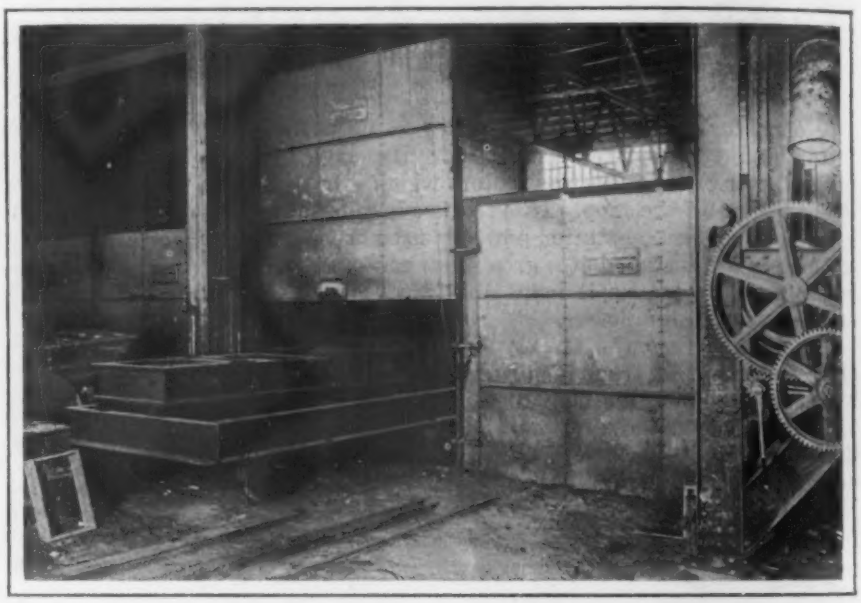
THE MANAGER OF THE BUSINESS

In our town there was a man who never attended very closely to his business. You could generally find him down at the club playing pool during business hours. He was in the paper mill business. He made quite a success of his business. He depended on a splendid manager, whom he employed to attend to everything. After the owner died, the business went on about as usual until the widow of the owner called in a lawyer to look over the business and see if everything was running straight. This lawyer was astounded at the salary being paid to the manager. The manager was a very unprepossessing looking man. As someone once said: "Nature often wraps up her most valuable packages in very poor looking covers." Such was the case of this man.

The lawyer could not believe that such an uncouth looking fellow needed such a large salary, so he advised the widow to reduce the salary, which she did. The manager quit. The firm failed. The widow lost her big house—moved into small apartments and tried to make a living teaching bridge. My brother met the widow's son the other day on the streets of Louisville, and gave him a dollar. He was down and out. The paper mill had lost its managing brains.

The question is, How are we going to find these wonderful geniuses to revolutionize our business? There is only one absolute true way of finding out and that is to split the foundry into small units, each as nearly independent and separate from the others as is practicable, with only 20 or 30 men in each unit. I say 30 because that is as great a number as ever should be under one overseer. If one runs nine hours a day, and if each foreman could give all his time to overseeing the men's work—which, of course, he cannot—it would allow him only about 13 minutes' time in the morning and 13 minutes' time in the afternoon to each workman.

In this system of small separate foundries you do not care how each small foreman manager arrives at a low cost of castings and a perfect product. It is up to him. As far as you are concerned, he can get it by replacing his poor men with rapid producers, or he can get it by constantly digging at his poor producers and teaching them where they fail. Each little foundry division is under the strongest kind of competition with its neighbors. There will be the greatest exchange of ideas between the different foundry foremen as to how they make good. The capable foremen will automatically come to the top.



Core Ovens for Heavy Work, Quigley Foundry

THE METHOD OF RATING FOR MANAGERS

The method to use to bring strong pressure to bear on the department heads is this, Make up the following tabulated records:

1. Number of pounds of good castings turned out each month by a department.

2. Total foundry hours of the department per month.

3. Molders' hours only, per month.

4. Helper's hours per month.

5. Coremakers' hours per month.

6. Casting cleaning hours per month.

7. Hours of any other class of help, such as cupola, crane men or foremen.

Divide the first item, or the number of pounds of good castings turned out by the department, by each of the following items: 2, 3, 4, 5, 6 and 7 and multiply by the hours in the work day, which gives the following records:

8. The day's output for each molder.

9. The number of pounds of castings each foundry helper helps on each day.

10. The number of pounds of castings a day each coremaker makes cores for.

11. The number of pounds of castings each casting cleaner cleans each day.

12. The number of pounds of castings turned out per capita of all other help (cupola, crane, foremen).

*From a paper read before the Pittsburgh Foundrymen's Association, February 9.

Comparison of these department records month by month will soon tell which department head is making the best showing.

Often a change in the class of work will interfere with a department making a good record, but a foreman who is a real genius will improve his record in the face of a change in the class of work that requires increased labor per pound of product. These tables should be kept graphically, because they will present a picture of conditions in the most comprehensive manner, where more tabulated figures fail.

It is a splendid idea to give each foreman a quarterly written statement of the pounds output per man for each class of the help he has under him. This acts as a spur to the foreman. The foremen take the keenest interest in these reports. To them the reports are a tangible statement which

Core Ovens for Light Work, Quigley Foundry

they can compare with their records of previous years. These reports keep reminding them that hours wasted will injure their record. A lazy man, a man who spoils work, or a slow man will not be tolerated, because such men increase hours without increasing the pounds output. The foreman will call the manager's attention to ill-shaped castings, patterns with lack of draft, the unnecessary hanging of cores in the sides or cope of molds under ram, or designs where loose pieces are used on patterns that could be eliminated by a change in design.

ANALYSIS IN MAKING CUPOLA MIXTURES

The second most important thing in making castings is the use of analysis in making iron mixtures, because this reduces the material expenses and improves the product. All the material bought by a foundry may run a little over one cent for each pound of castings, yet a foundry will try to strain the output per man up 10 per cent and pay no attention to the heavy expense of running a mixture half of which is costly pig iron.

Our foundry before mixing by analysis used 40 to 50 per cent. scrap in the mixture. After it changed over to mixing by analysis, we ran four months averaging 74½ per cent. scrap, or off-grade iron at scrap-iron prices, in the mixture. Three weeks of this time the mixture was 80 per cent. off-grade iron, three weks 77 per cent. off-grade iron, three weeks 73 per cent. off-grade iron, and three weeks 69 per cent. off-grade iron.

CHARGING THE CUPOLA

The two main points in charging a cupola are: keep the charges absolutely level throughout the heat and charge the coke and the large pieces of iron around the very edge, and the small pieces, that is, the scrap, in the center. To keep the charges perfectly level, the kindling must be in short pieces, 2 ft. long and no longer. The kindling must be put in and leveled absolutely, otherwise when it burns out it will tilt all the charges above.

Each succeeding charge must be put in absolutely level. The coke against the wall of the cupola and nowhere else so that the strong air blast from the tuyeres will strike it and thus make very hot iron. The pigs and heavy scrap must be put in around the edge, as they are the hardest to melt and must be placed where the greatest heat is. The pigs should lie around against the wall in a perfectly neat ring, the end of one pig butting against the end of the next. Light the fire after two-thirds of the bed coke is charged. After lighting, charge the other third coke.

A new type of electric drilling machine is being manufactured by the United States Electrical Tool Company, Cincinnati, Ohio. It is especially adapted for metal drilling or wood boring, and is equipped with a universal motor for operating on 110-volt direct or alternating current circuits. Chrome nickel steel is used for the gears, which are hardened and run in grease, and all the spindle bearings also run in grease. The motor is of the series wound type and is air cooled. A new and simple type of switch is used in connection with the machine.

Electroplating Zinc Alloy Die Castings

A pamphlet has been issued by the National Lead Company, New York City, describing the electroplating of die or pressure castings, made from alloys of zinc and varying proportions of copper, tin and aluminum. These castings are used as a substitute for numerous small parts that were formerly cast in sand molds of iron, brass or bronze and come from the dies as perfectly machined castings, requiring only a small amount of labor to assemble. A detailed explanation of the cleaning and polishing is given and it is pointed out that caustic soda or potash should not be used in cleansing zinc on account of the reducing action they exert upon the metal which destroys the polished surface. Solutions for plating the castings with copper, brass, nickel and silver are given, together with instructions for their use. Directions for gilding die castings, which must previously be coated with brass or copper, are included, together with the composition of the solution employed. The customary lacquers are applied to the metal finishes and the several antique finishes can be applied to the articles after plating in the requisite solutions in the regular way.

At the annual meeting of the Smith & Mills Company, manufacturer of shaping machines, Cincinnati, Ohio, held February 5, the following directors were elected: Albert S. Smith, Ernest Mills, James E. Mills, William Schuchardt and Oscar P. Soden. The board organized by electing Albert S. Smith, president, treasurer and general manager; Ernest Mills, vice-president, manager and superintendent, and James E. Mills, secretary.

Pure Drinking Water from Waste Heat

To Reduce Absences of Factory Workers and to Utilize Exhaust Steam, the Installation of a Water-Distilling Plant Is Justifiable

BY STERLING H. BUNNELL

The last ten years has witnessed a great change in water supply practice. Not many years ago the American city with a water supply from a source really pure was the exception. Quantity, not quality, was the chief end sought. Some cities took their supplies from lakes at points adjacent to sewerage outlets, depending on dilution to protect the water from an oversupply of bacteria. Others pumped from canals or shallow streams which served also as drains for populous parts of the country. Better sources of supply, being more distant, were deemed too expensive, for an unlimited quantity of fair water was often preferred to a limited supply of good water metered to prevent waste. It required many epidemics of typhoid fever and other diseases spread by germs in water supplies to eradicate this fixed idea and cause the general demand for pure drinking water which today exists nearly everywhere.

While water works engineers are working out great problems of purifying city supplies by filtration or bringing water from far distant mountain lakes and streams, the present need has been met by an astonishing development of the sale of pure spring water, or of distilled water, in bottles. The supply of ice for water coolers has been extended to include the supply of the coolers and stands, and then to the supply of the drinking water as well. While ice and water have been sold at reasonable prices, and coolers often loaned or given away, the profits from the business when well managed are enormous. This fact would not seem surprising in the cases where natural springs close to town have been found and utilized. Such springs, however, exist in but few of the localities where pure water is needed in great quantity. Much of the water supplied at good profit for drinking purposes is obtained by distilling. Its low cost is generally due to the use of the waste heat obtained from exhaust steam, to furnish the heat necessary for distillation. As exhaust steam is discharged from every factory power plant during those months of the year when drinking water is most in demand, it is evident that pure drinking water can be supplied in the factory at trifling expense.

An evaporating plant for factory water supply is an extremely simple apparatus. It consists of a shell of steel or cast iron, kept partly full of raw water by a float-controlled valve, and a set of steam-heated tubes of brass or copper, submerged in the water. The heat of the steam in the tubes is given up to the water surrounding them, heating and evaporating a quantity somewhat less than the amount of steam condensed in the tubes. Distilled water is thus obtained at two points, one the drain from the tubes, and the other the drain from a condenser in which the vapor from the raw water in the shell is received. The steam supply, if from an engine or pump exhaust, is passed through an oil separator before entering the evaporator tubes, and so purified before condensing into water. The vapor from the raw water is essentially pure, and needs only to be condensed into water. The two streams of water issuing from the apparatus are joined and passed through a charcoal filter which removes the flat taste peculiar to boiled water. The filtered water is soft, absolutely pure, and faultless in taste.

Evaporation, it will be noticed, is performed by the exchange of heat from steam condensing to water into water evaporating to steam. The exchange can be effected repeatedly, with the production of an additional quantity at each repetition. Thus, steam at 100-lb. pressure may be condensed in tubes while evaporating water at 70 lb. around them. The resulting vapor at 70 lb. may be led into another evaporating effect and condensed in tubes while evaporating water at 45 lb. and so on until the last effect in the series works under a vacuum as low as can be easily produced in a surface

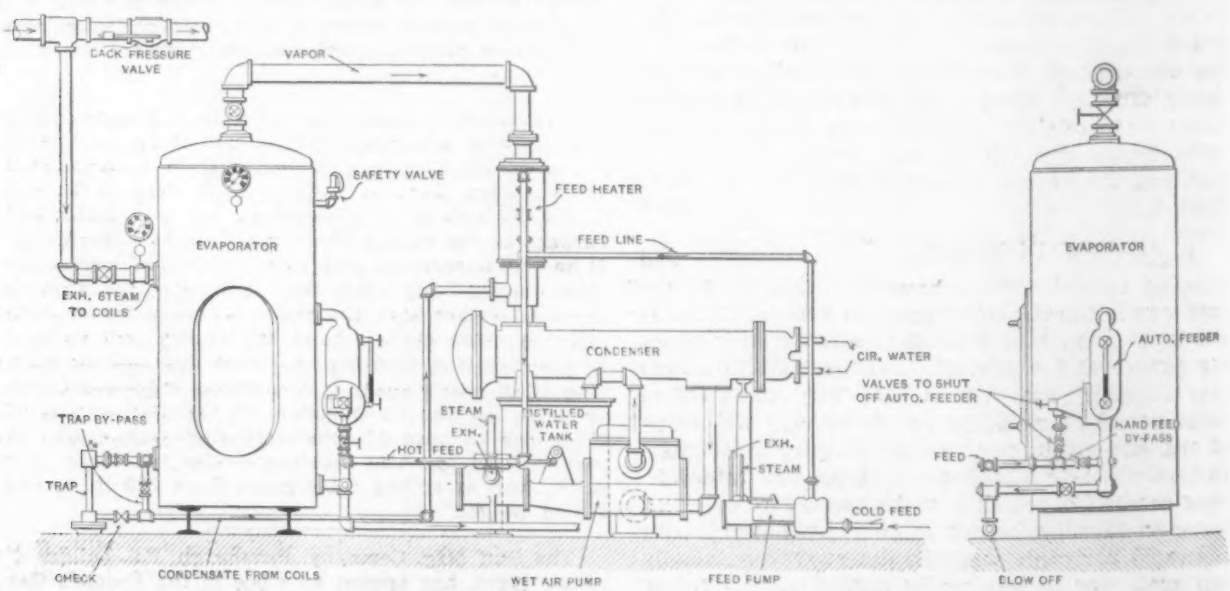
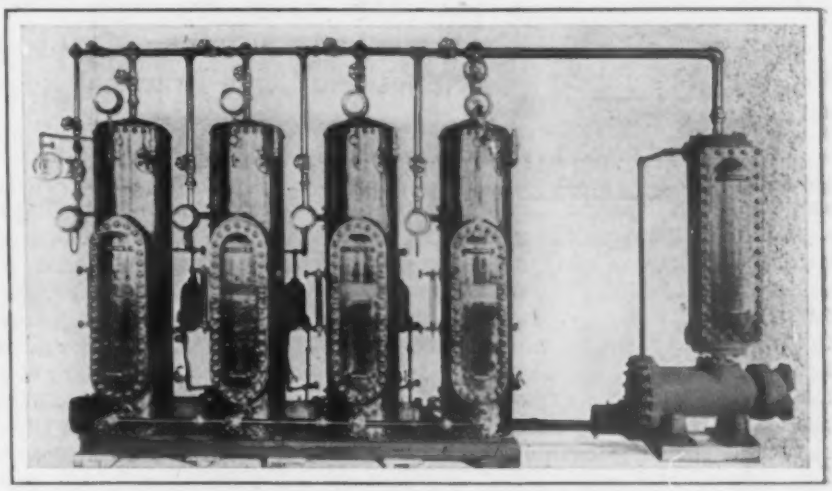


Diagram Showing the Arrangement of the Various Parts of a Typical Exhaust Steam Single Effect Plant

condenser which follows the last effect and collects the distilled water produced there. The process may be started at any pressure and carried down to any desired one above or below atmospheric pressure. Each effect produces 80 or 90 per cent. as much steam as it receives in its tubes, the exact ratio depending on the feed temperature, the quality of the lagging protecting the tubes from loss of heat by radiation and other details. Therefore, with a small quantity of exhaust steam, two, three or more times the quantity of distilled water may be produced. The ordinary steam pumps of a factory will generally furnish ample exhaust to supply all the drinking water required. If, however, the exhaust steam is not sufficient in quantity, steam may be taken direct from the boiler and made to produce five or more times its own weight of distilled water by condensation.



A Quadruple-Effect Evaporating Plant Installed in a Factory to Provide a Supply of Pure Drinking Water

The gain in the efficiency of the working force when supplied with pure soft drinking water has been in many cases surprising. It is not necessary to become involved in the technical controversies of medical authorities, some of whom advocate the exclusive use of chemically pure water, while others profess to observe some virtue in hard natural waters. It is safe to say that pure, germ-free water is always preferable for drinking purposes to natural water of suspected impurity. If one believes there is benefit in drinking some natural water, he may be content with the knowledge that the supplying of distilled water in the factory does not prevent the employees from averaging up their drinking water by taking what they want from natural sources when away from the works. The distilled water should be supplied at convenient points by circulating pipes from a cooling device and through sanitary drinking fountains. The fact is that where pure cooled water has been so supplied throughout a factory, an important decrease in loss of time by absence caused by digestive disorders has been observed. An increase in the working efficiency of the men generally may be confidently expected, though this would not be easy to measure. The gain in attendance is not only observable but is large enough to be conspicuous. Further, the men soon learn that the water is healthful and often carry home a supply, which practice should be permitted and encouraged.

Small evaporating plants are inexpensive and simple to operate. They have no moving parts, except a feed pump, if the factory service pressure is not high enough to feed the evaporators, and an air pump; and single-effect exhaust-steam plants may dispense even with these. The only matters requiring any care at all are to permit the escape of the organic gases in solution in natural water, to blow the evaporator down at regular intervals, once every hour in most cases, so as to keep the water in the shell from becoming too dense with concentrated solids and to clean off occasionally any scale which may be deposited on the tubes. These details are provided for in the design of the apparatus.

The diagram shows the relation of the several parts of a single-effect exhaust-steam evaporator, and the halftone engraving is reproduced from a photograph of a quadruple-effect plant as actually installed. Larger plants are made up of a series of similar evaporating units or effects with but one condenser which follows the last effect. But whether single or multiple effect, an evaporating plant in the factory will be found a useful means of making a valuable by-product—pure water, from a factory waste—exhaust steam.

Furnace Slag for Street Foundations

Some observation on the use of blast-furnace slag as a foundation for paved streets were made in a recent issue of Engineering News, by Harvey F. Brown, engineer, borough of Charleroi, Charleroi, Pa. He appears to have had success with ordinary bank slag, the rough product from the furnace as it is deposited at the slag bank, used with a top coat of screenings, the residue from crushed slag passing through a 1-2 in. screen. The combination of the bank slag and the top coat of screenings is rolled by a 10-ton tandem roller to a compact thickness averaging 7 in. The slag, because of its keen edges, takes more rolling to compact it than is required for broken stone or gravel, and, owing to the labor cost and the cost of the screening, is limited to use in localities having low freight rates from the steel mills. Mr. Brown adds that the railroads have discovered that fills of granulated slag, the product of pouring molten slag into water, settle little and become more compact than other material.

The Steel Improvement Company, Cleveland, Ohio, is placing in operation what is said to be the largest heat-treating furnace ever installed in a commercial heat-treating plant. It will be 21 ft. deep, 6 ft. wide and 4 ft. high inside dimensions. It is a double end furnace of the semi-muffled type, fired by natural gas. It has six burners on each side. Instead of having the flames enter both sides, they will enter the furnace chamber on one side, the outlet being on the opposite side. A 2-ton electric hoist and trolley will be used in charging and discharging. Each door will be operated by a hand wheel in connection with a counterbalance. In the construction of the furnace 16,000 brick and 20 tons of structural steel were used. It will be used for heat treating shafts and large gear work, such as rolling table gears from 200 lb. to one ton in weight.

The Duff Mfg. Company, Pittsburgh, Pa., builder of lifting jacks, has opened an office in the People's Gas Building, Chicago, and will also have a warehouse in that city to enable prompt deliveries to be made. G. W. Parsons has been appointed district sales agent, with offices in the Pioneer Building, St. Paul, Minn. By mutual agreement Fairbanks, Morse & Co. have discontinued acting as exclusive steam railroad agents for the Duff Company.

The Theisen Process for Cleaning Gas

A New Type of This German Washer—Description of the Machines and Some Practical Results

The Theisen process for cleaning gas, especially blast-furnace gas, is known by name to most iron and steel men, because Theisen was the first to put a practical washer on the market capable of dealing with the enormous quantities of gas given off by the modern furnace. The first washer was mounted on a vertical axis, but this was soon followed by the horizontal type, of which more than 500 have been built and put in operation. In order to meet modern requirements a new type of Theisen washer has been worked up during the last few years, known as the disintegrator washer. It uses much less power and water, and on account of its efficiency has been very well received. This new type of washer is described in Stahl und Eisen for December 18, 1913, and operating results of various plants are given.

DESCRIPTION OF MACHINES

The apparatus is built on the joint-current and counter-current principle. It fulfills in the one machine all the requirements of economic gas cleaning by thoroughly mixing and forcing the gas and water together through the disintegrator arrangement. It also causes the gas to repeatedly strike against suitable washing surfaces, as well as transports the gas and increases its pressure. In the joint-current disintegrator shown in Fig. 1 the gas and water travel from the inside to the outside of the disintegrating arrangement, while in the counter-current type shown in Fig. 2 the gas flows in opposition to the water through the disintegrator from the outside to the inside. In general the first type is used for gas already cooled, while the second is used for hot gas.

The casing of the joint-current apparatus resembles that of a fan. The gas enters from both sides to the middle. On the outside of the entrance passages are the castings containing the ring bearings, through which passes the shaft to the center of which a cast-steel disc is fastened. On both sides of this revolving disc a cast-steel ring is arranged which bears cylinders of angle iron. Similar rings are fastened to the inner walls of the casing carrying stationary cylinders. The rotating and stationary cylinders are arranged concentrically one inside another. The water for washing is carried through siphon tubes to the interior of a distributing cone on the shaft, which is pierced with holes and provided on the outside with spray plates. Here the water is finely divided, and strikes the first rotating cylinder. The gas and water mixture are then hurled against the recoil surfaces of the stationary cylinder by the centrifugal action, whereby the water is broken up to extremely fine vapor and intimately mixed with the gas. This brings about a thorough moistening of the dust particles in the gas. This action is repeated by the succeeding revolving and stationary cylinders so that the dust particles in passing through the disintegrator are taken up and retained by the water.

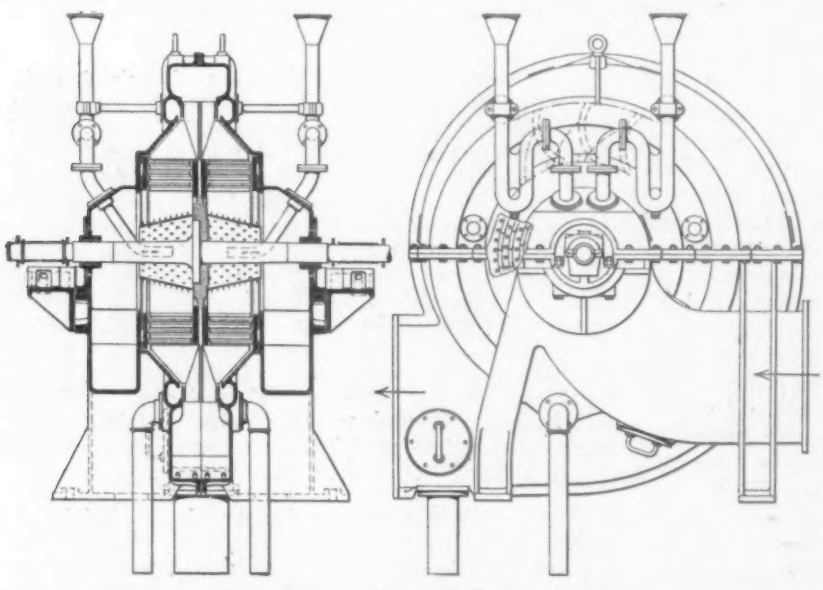


Fig. 1—Theisen Joint-Washer with Disintegrator Construction

METHOD OF OPERATION

The gas-water mixture is sucked through the disintegrator by the fan blades mounted on the outer part of the disc. The inner part of these blades is inclined and open so that the mixture is hurled sideways against a washing surface built concentric to the fan blades. The water vapor saturated with dust particles separates and moves to the outside as a fluid sheet. The gas is repeatedly forced violently against this sheet of water as in the known and proved Theisen centrifugal washer. The water moving outwards is caught at the edge of the surface in a groove and led away, and because of the arrangement of the groove does not reach to the real pressure blades. This explains the smaller power requirement and the higher pressure produced. The outer part of the fan blades are shaped radially, formed as pressure blades, so that they are closed sideways. They force the highly cleaned gas to the fan casing, from which it passes under pressure to the mains and the places where it is used.

In the case of the counter-current washer shown in Fig. 2 the gas enters underneath and at once meets the water spray from the disintegrator, so that even in the large gas entrance considerable cooling and cleaning of the gas takes place. The gas then passes through the disintegrator in the opposite direction to the washing water. An intimate mixture and violent agitation of the gas and water takes place as in the previously described machine. Because of the cooling and cleaning of the gas as it enters the washer, and the counter-current principle, it is possible to deal with hot and very dirty gas without special pre-cooling and pre-cleaning. After passing the disintegrator the gas is subjected to repeated violent

impulses against an inclined washing surface as in the other machine. The water is introduced as shown in the diagram, and also sideways to prevent any unwashed gas passing through.

The Theisen disintegrators are thoroughly reliable, as has been proved by operating records of over a year. All rotating parts are mounted on a common shaft, that revolves in water-cooled ring bearings, and is directly coupled to the driving motor. It requires the least space of any gas washer because the cooling, cleaning and compression is carried out in the same apparatus and with one driving motor. Very little attention is therefore necessary, by no means the constant service of an operator. The wear and tear, and oil consumption, are also reduced to a minimum, for in the whole apparatus there are only two bearings. No growth of dirt can form because of the powerful washing and rinsing of all parts of the machine. As mentioned before, these points are confirmed by operating results. The fan blades are shaped so as to furnish gas at the pressure required, and there is no difficulty in giving clean gas up to 0.57 lbs. per sq. in. Theisen water separators are also built to dry the washed gas to the saturation point or lower. They are built on the principle of change of velocity and direction, and furnish dry gas, which is very important. Such driers are necessary for all gases that are cleaned by being brought into intimate contact with water.

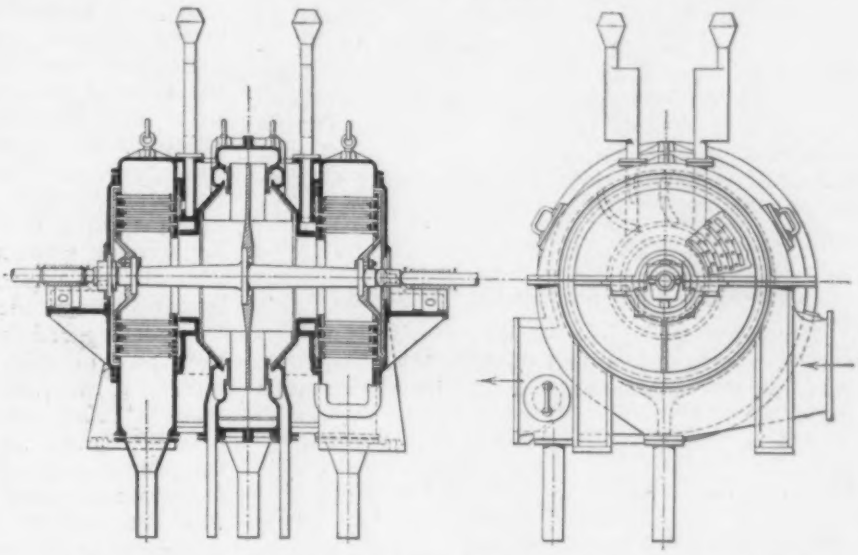


Fig. 2—Theisen Counter-Current Washer with Disintegrator Construction

OPERATING RESULTS

The first Theisen disintegrator was tested at the plant of the Schalker Gruben und Hüttenverein at Gelsenkirchen in 1909. The results showed a reduction in the dust from 4.0 to 0.031 g. per cu. m. (1.75 to 0.013 g. per cu. ft.) At the Differdingen blast furnace plant a Theisen disintegrator and water separator has been in operation since 1912 without interruption. It was furnished as a precleaner to lower the dust from 4.0 to 0.3-0.5 g. per cu. m. Due to good pre-cooling, however, the gas only has from 0.88 to 1.46 g. per cu. m. as it enters the machine, so that much better results were obtained than guaranteed. Very many tests have been made at Differdingen, the average results of which are given in Table 1. Based on these results Theisen has built for Differdingen large disintegrators for 50,000 cu. m. per hr. capacity (1,765,700 cu. ft.) furnishing clean gas at 0.54 lb. per sq. in.

At the Rombacher Hütte at Rombach there are two Theisen disintegrators each of 30,000 cu. m. hourly capacity. One has already been steadily in operation for 14 months, and the other was started about June, 1913. This apparatus should clean the gas to from 0.1 to 0.2 g. per cu. m. with a maximum water consumption of 0.7 litre per cu. m. Very exact tests were carried out, the results of which are given in Table 2. No. 2 machine did not produce so high a pressure because a washing surface was built concentrically around the fan. The increased power consumption is partly due to this cause and the fact that more water was used. This surface was later taken away because the required cleanness was more than reached without it. The temperature measurements show that with gas and water entering at almost the same temperature the outgoing gas is slightly hotter, due to part of the energy being changed to heat. Three more Theisen washers, each of 45,000 cu. m. per hr., have now been installed.

Illustrations are given in the original paper of one of two similar machines of 40,000 to 45,000 cu. m. hourly capacity that have been in operation

Table 1. Results at Differdingen

Amount of gas at 50 deg. C. cu.m.	Gas pressure: In pipe before washer, mm. water	Gas pressure: Between washer and separator: Mm. water	Gas pressure: Between washer and separator: Lb. sq. in.	Increase mm. water	Dust content: Before washer: G. per cu.m.	Dust content: After washer: G. per cu.m.	Dust content: After washer: G. per cu. ft.	Gas temp.: Before washer, deg. C.	Gas temp.: After washer, deg. C.	Water temp.: Before washer, deg. C.	Water temp.: After washer, deg. C.	Water consumption, liter cu.m.	Total power consumption, hp. per 1000 cu.m.	R.p.m.
44,327	−70.5	+130.3	0.185	200.8	1.080	0.020	0.0087	40.0	40.5	30.0	39.3	0.684	5.55	668
47,353	−90.0	+150.0	0.213	240.0	1.000	0.012	0.0052	32.5	33.5	29.0	33.0	0.555	5.43	658
48,515	−85.0	+153.0	0.217	238.0	0.944	0.018	0.0079	33.3	34.5	29.5	33.8	0.550	5.22	649
46,611	−85.0	+158.3	0.224	243.3	0.880	0.008	0.0035	32.5	33.5	29.0	33.0	0.430	5.00	677

Table 2. Results of hour tests at Rombach

Amount of gas at 20 deg. C. cu.m.	Gas pressure: In pipe before washer, mm. water	Gas pressure: Between washer and separator: Mm. water	Gas pressure: Between washer and separator: Lb. sq. in.	Increase mm. water	Dust content: Before washer: G. per cu.m.	Dust content: After washer: G. per cu.m.	Dust content: After gasometer: G. per cu.m.	Dust content: After gasometer: G. per cu.ft.	Gas temp.: Before washer, deg. C.	Gas temp.: After washer, deg. C.	Water temp.: Before washer, deg. C.	Water temp.: After washer, deg. C.	Water consumption, liter cu.m.	Total power consumption, hp. per 1000 cu.m
30,252	−30.0	+196.5	0.279	226.5	0.22	0.014	0.011	0.0048	29.0	31.0	27.0	30.4	0.549	4.1
30,312	−22.9	+137.1	0.194	160.0	0.35	0.016	0.012	0.0052	30.6	31.3	26.4	30.8	0.609	4.5
43,050	−55.0	+130.0	0.184	180.0	0.37	0.019	0.019	0.0083					0.387	2.9
					0.38	0.018	0.015	0.0065						

since the beginning of 1912 at the Hasper Eisen und Stahlwerke. The dust is reduced from about 2 g. per cu. m. to 0.017 to 0.018 g. per cu. m. The results are also given of a disintegrator applied to pre-cooled producer gas. The tar was reduced to 0.2-0.4 g. per cu. m. from an original of 45 g. The results are also given of a small machine at the Krupp Rheinhausen plant used for blast furnace gas. Finally figures are given from an Austrian plant that uses a Theisen machine in a strictly comparative manner with a Swartz-Bayer disintegrator, the results being greatly in favor of the former.

Germany's 1913 Iron and Steel Exports

The following table gives some statistics of Germany's exports of iron and steel in December, 1913, and for the entire year 1913, in metric tons (2204 lb.):

	December		Entire Year	
	1912	1913	1912	1913
Pig iron	90,259	57,886	1,058,843	856,431
Scrap	17,842	18,807	160,732	196,221
Semi-finished steel	81,459	63,969	695,263	700,779
Beams	47,769	25,400	497,023	446,859
Other structural shapes	83,202	116,218	846,814	1,172,626
Heavy plates	27,471	48,923	298,674	460,817
Thin plates	10,835	15,861	125,228	149,362
Wire, rolled or drawn, plain	23,811	24,787	281,268	275,803
Wire, polished	14,114	19,030	152,445	186,023
Wire nails	4,921	6,090	54,482	65,862
Tubing	15,619	18,641	169,764	209,457
Steel rails	48,115	43,824	523,218	500,835
Steel railroad ties	21,885	16,880	191,590	134,293

The total exports of iron and steel for the year amounted to 6,497,000 tons, as compared with 6,042,000 tons in 1912, an increase of 455,000 tons. Imports were 618,000 tons in 1913, as against 674,000 tons in 1912, a decrease of 56,000 tons.

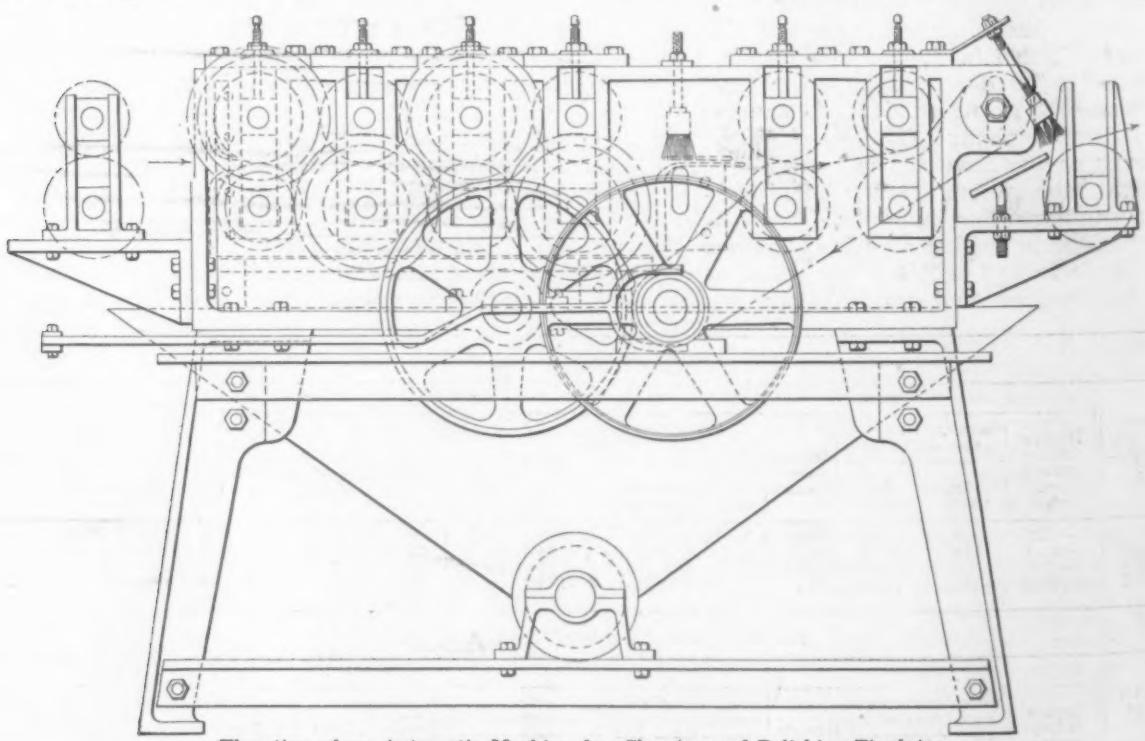
A new cast-iron brazing material is announced by the Phillips-Laffitte Company, Pennsylvania Building, Philadelphia, Pa. It appears to be a chemical paste known as Unifonte, produced by the Paris laboratory of the company, and this paste with flux and spelter is employed to repair a broken part without, for example, moving the casting affected and, it is emphasized, without warping or deforming the broken article. In applying the paste a brazing torch or gas blow-pipe is used. It is claimed that a joint brazed with this material is about three times stronger than the original metal.

Tinplate Cleaning and Polishing Machine

For cleaning and polishing tinplates in the manufacturing process, the Elwood Iron Works Company, Elwood, Ind., has developed an interesting machine. After the sheet of steel, which forms the basis of the tinplate, has passed through the tinning pot and is coated, it is automatically lifted to a conveyor which varies in length from 12 to 14 ft., according to local conditions. This conveyor takes it to the intake rolls of the cleaning-polishing machine, which comprises 12 rolls made up of Canton flannel disks. The machine has a hopper and screw conveyor of sufficient length to pass the cleaning material to the elevator, which in turn brings the material back to the machine. The gearing of this machine is proportioned so that each pair of rolls runs at different speeds. The top roll of the first pair runs at a speed of approximately 200 r.p.m., while the bottom one makes only 50 r.p.m. In the next pair the top roll has the slow speed and the bottom one operates at approximately 200 r.p.m. It is pointed out that this arrangement makes it possible to complete the thorough cleaning of the sheet on both sides, as the first four pairs of rolls alternate in speed.

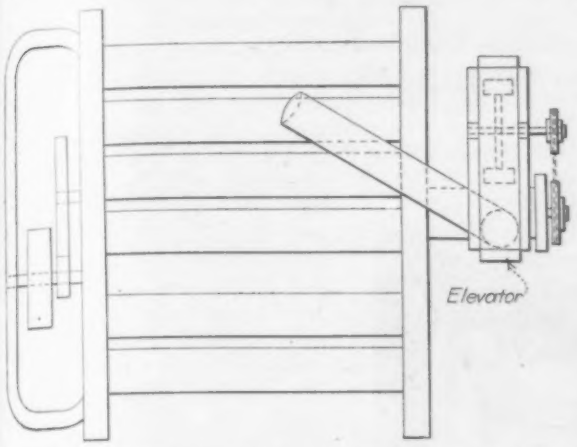
The cleaning material used in these machines is furnished by the mills in the Northwest and is of an especially prepared type, being of a grade between high-class middlings and low-grade flour. This material is evenly distributed from the downspout as it is received from the elevator, and this is one of the features of the machine. It is pointed out that the mechanical distributor, which consists of a right and left hand screw inclosed in a 6-in. pipe, with openings directly over the rolls, will deliver the material in exact proportions on all parts of the plate, instead of allowing it to pile up between the first two pairs of rolls, as was formerly the case, and then distribute itself by gravity on the plate as it was passing through.

After the sheet leaves the cleaning end of the machine it goes to the polishing compartment, first passing under a brush between the two sets of rolls. This brush is relied upon to sweep off any particles of the cleaning material that may adhere to the sheet during the cleaning operation. In the clean-



Elevation of an Automatic Machine for Cleaning and Polishing Tinplates

ing compartment the first pair of rolls runs at an alternating speed of from 25 to 33 1/3 per cent. higher than the rolls in the other compartment,



Plan View of the Machine Showing the Elevator for Handling the Cleaning Material

an arrangement which is relied upon to deliver the plate in a thoroughly cleaned and polished condition. The brush at the exit end of the machine serves practically the same purpose as the one between the two groups of rolls. This brush is needed as frequently either the material is carried through on the plates themselves or small particles float in the air and settle down on the plate while going through the polishing end of machine which contains the two pairs of rolls.

This machine is driven by a chain and sprockets. It is stated in connection with the type of drive that only slightly more than one-half the horsepower usually required by this type of machine is consumed, and in addition, noise is practically eliminated.

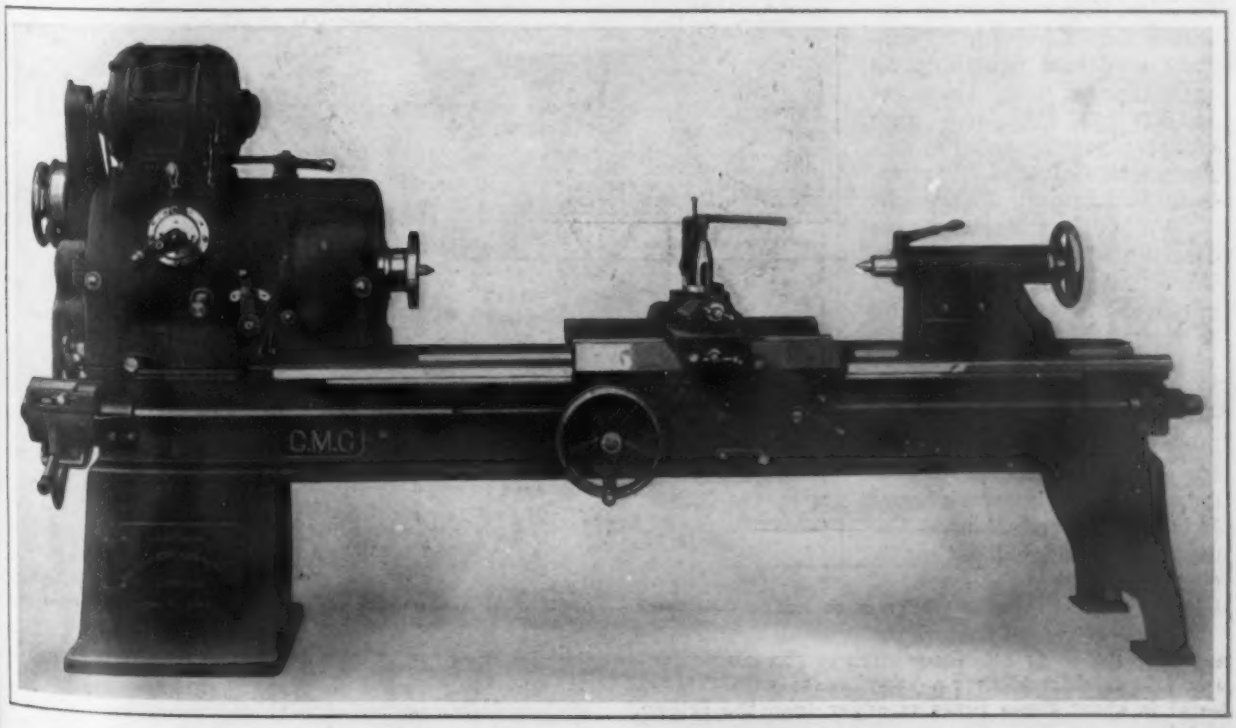
A New Lathe with an All-Geared Head

The Canada Machinery Corporation, Ltd., Galt, Ont., Canada, has recently brought out an all-geared type of lathe. The special feature about the tool is the use of a totally inclosed all-gear type of headstock, which makes 18 speed changes available from any one speed of the driving motor or pulley. It is possible to interchange the geared heads with the three sets of regular double-back geared headstocks built by the company. As illustrated, the machine is equipped with a direct-current constant-speed motor, but if desired, it can also be arranged for a single pulley belt drive. Another feature about the lathe is the possibility of locking the spindle when the faceplate is being changed.

The 18 speed changes that are available are secured through 13 gears arranged in two sets and a double jaw clutch. Steel forgings, which are hardened when necessary, are used for all the gears, which have the ends of their teeth rounded. For releasing the load when the gears are being changed a friction clutch is provided for the driving pulley. It is pointed out that it is impossible to engage two different sets of gears simultaneously. The tooth clutches are made of hardened steel and the spindles, which are of high carbon steel, finished by grinding, run in bronze bearings. To indicate the positions of the different levers for securing the various speed changes index plates are provided on the headstock. As the headstock totally incloses the gears, an oil bath is thus provided for the gears to run in at all times.

When changing the faceplate means are provided for keeping the spindle in one position. This consists of a special locking pin, which enters a corresponding hole in the sleeve clutch of the main spindle, an arrangement which is relied upon to keep the spindle from rotating in either direction.

A National Conference on Unemployment has been called by the American Association for Labor Legislation, to take place in New York City on Friday and Saturday, February 27 and 28. According to the preliminary announcement made by Prof. Henry R. Seager, Columbia University, the president of the association, it is intended that the conference will come at a time when emergency relief will probably have been tested in most American cities and when it will be favorable to draw up a programme of practical action to prevent what is referred to as the serious irregularity of employment which is not temporary in America. Governors and mayors have been invited to attend or send delegates.



A Lathe Having all the Speed Changing Gears Entirely Inclosed

Social Side of a Grand Rapids Brass Plant

Provisions for Employees' Welfare a Notable Feature at the Plumbing Goods Manufactory of the Wolverine Brass Works

The fascination about a manufacturing plant which takes a mass of raw material and converts it by successive stages into a finished product, ready for the consumer, is increased when this self-contained system extends its field of action to the molding of the life of the employee himself. Money spent in the betterment of the social and physical conditions of employees is well invested, at least such is the belief of L. A. Cornelius, president of the Wolverine Brass Works, Grand Rapids, Mich., who has seen the plant of this company develop from a small two-story frame building with a modest shingle above the entrance into a reinforced concrete structure providing an approximate floor space of 142,000 sq. ft. and with branch plants operated in San Francisco, Cal., and Chatham, Ont.

View in North Wing of Brass Foundry of Wolverine Brass Works

While many factors have contributed to the success of the company, one of the most important of these, according to its president, is the habit on the part of those in authority of considering the worker not as a machine, but as a human being whose capacity for the performance of productive toil during work hours is largely dependent upon the manner in which his time is employed during the hours of leisure.

The entire fifth floor of the main building at the plant of the company is used for the benefit of employees. The equipment includes a well-equipped gymnasium with shower baths and locker rooms, several recreation rooms, one of which is shown in an accompanying illustration, and a large dining room and a kitchen. Meals are prepared and served to all employees and the latter do not need to leave the plant during the noon hour. Athletic activities have developed indoor and outdoor baseball teams, both of which are members of the factory league, and last year one of these teams was successful in winning the Grand Rapids Manufacturers' League cup. Opportunity is given to employees for participation in the profits of the company by investing in shares of the company's stock.

Care of the employees during working hours is evidenced by the careful attention to sanitary conditions, including proper lighting and ventilation. Bubbling drinking fountains are present on all floors and these are supplied with good water. The equipment includes toilet rooms for both sexes on all floors and clothes lockers conveniently located.

Access to the five floors of the building is furnished by automatic electrically-driven freight and passenger elevators operated by the passenger himself by a push button system. The generating plant supplies alternating current at 460 volts stepped down to 120 volts.

A Corner in One of the Employees' Recreation Rooms

The basement is occupied by the foundry, copper float department, metal cutting room, punch press room, scrap metal baling room, and coreroom. Of

these divisions, the foundry is by far the largest. The equipment for the latter consists of two coke brass furnaces and six crucibles, served by an overhead traveling chain hoist system, as shown in one of the illustrations.

The room for baling scrap material adjoins the foundry, and from there the metal is carried to the crucibles for melting. The equipment includes a special machine for compressing and baling the scrap material into 40-lb. bundles.

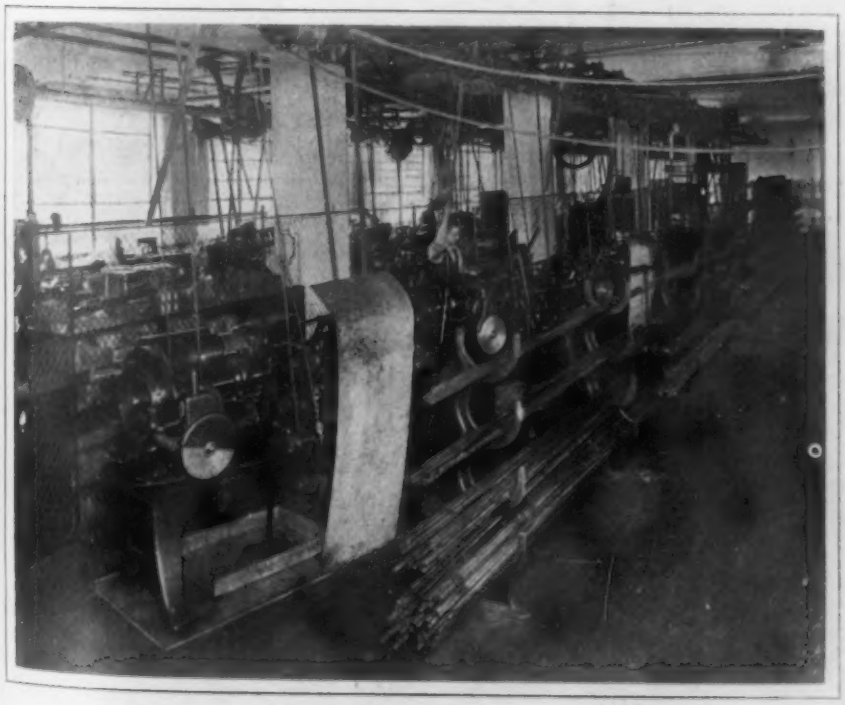
The tool and screw machine rooms occupy the first floor. In the first of these rooms all tools used by the company are manufactured and repaired, while in the second room is located a long row of machines in which are manufactured the various screws which enter into different plumbing specialties. The receiving room, stockroom, blacksmith and drafting office are also located on the first floor.

The second floor houses the shipping room, general and private offices, stockrooms and box-making department. The shipping room communicates directly with the general offices, thus facilitating the routing of shipments.

Labor-saving office filing systems are in evidence in the spacious business offices, and the office of the chief executive is built with soundproof walls and a maximum of glass area. Indirect electric lighting chandeliers of artistic design are a part of the equipment.

The assembling and testing departments occupy the greater portion of the third floor. Here the manufactured products are carefully tested before being finally assembled to be wrapped and boxed for shipment. The remainder of the third floor is occupied by the compression, stock, and soldering rooms, and the tin shop. The buffing and polishing department, employing 100 men, and the nickel plating department are located on the fourth floor. The latter is equipped with 15 plating vats.

A Section of the Assembling Department



Equipment of the Automatic Screw Machine Department

Income Tax Explained to Newark Foundrymen

The Newark Foundrymen's Association, Newark, N. J., at its meeting held on the evening of February 5, was addressed by W. M. Van Deusen, cashier National Newark Banking Company, who explained the provisions of the Federal income tax law, the exemptions under the law and the regulations governing its application, so far as they have been issued by the United States Treasury Department. Inasmuch as in the majority of cases there is so little at stake he urged a liberal attitude toward the Government. He believed the administration of the law would be lenient and that in all probability considerable time will elapse before it will be running smoothly. Mr. Van Deusen has made a study of the new law and of similar laws and he was earnestly thanked by the members for his clear exposition of the subject.

The meeting was preceded by the usual dinner, after which there was a short business session with President Gerald Hanney, Oscar Barnett Foundry Company, in the chair. In reading the minutes of the previous meeting, Secretary A. E. Barlow, Barlow Foundry Company, expressed appreciation of the manner in which *The Iron Age* reported the meetings of the association, his remarks being applauded by the members. The executive committee, James Flockhart, Maher & Flockhart, chairman, having taken favorable action, the following companies were elected to membership: Carborundum Company, New York, and Bierman-Everett Foundry Company, Irvington, N. J.

Official figures just issued show that the iron ore output of Russia in 1912 was 8,077,000 gross tons, as compared with 6,881,000 tons in 1911, an increase of 1,196,000 tons or 17.4 per cent.

Wall Type Radial Drilling Machine

For use in plants where large surfaces have to be covered for drilling and reaming, such as structural iron works, boiler and bridge shops and shipyards, the Vulcan Engineering Sales Company, 2059 Elston avenue, Chicago, Ill., is marketing a wall type of machine. In designing the machine efforts have been made to eliminate vibration, to centralize the levers and handwheels within easy reach of the operator and to build a tool that will stand up under the hard usage that it is likely to receive.

The construction of the machine makes it possible to bolt it fast to a building column, as illustrated, to a wall or to mount it on a post in a car, the last arrangement, it is emphasized, giving a portable tool that can be moved to any position in the shop and which is an advantageous feature in any plant where long lines of holes are to be reamed, as is the case with bridge girders, hulls, etc. When holes of large diameter are being drilled, the boom can be anchored to the floor as a stud is provided in the boom end for this purpose. The wall plate is a heavy casting having machined ways to guide the elevating carriage. This in turn supports the boom and sway bars and has large bronze bushed lugs through which the vertical shaft passes. The screw shaft for raising and lowering the carriage is actuated by cupped brass frictions engaging with spur gears and the vertical load is taken on hardened steel ball bearings.

A heavy casting, reinforced by ribbing, is used for the spindle carriage, which can be locked in position when drilling and reaming. The truck wheels are roller bushed and the carriage is arranged to take the direct thrust of the spindle. The end thrust of the spindle is taken upon ball bearings and the spindle is mounted within a sleeve, which is ground to fit the bore of the carriage frame.

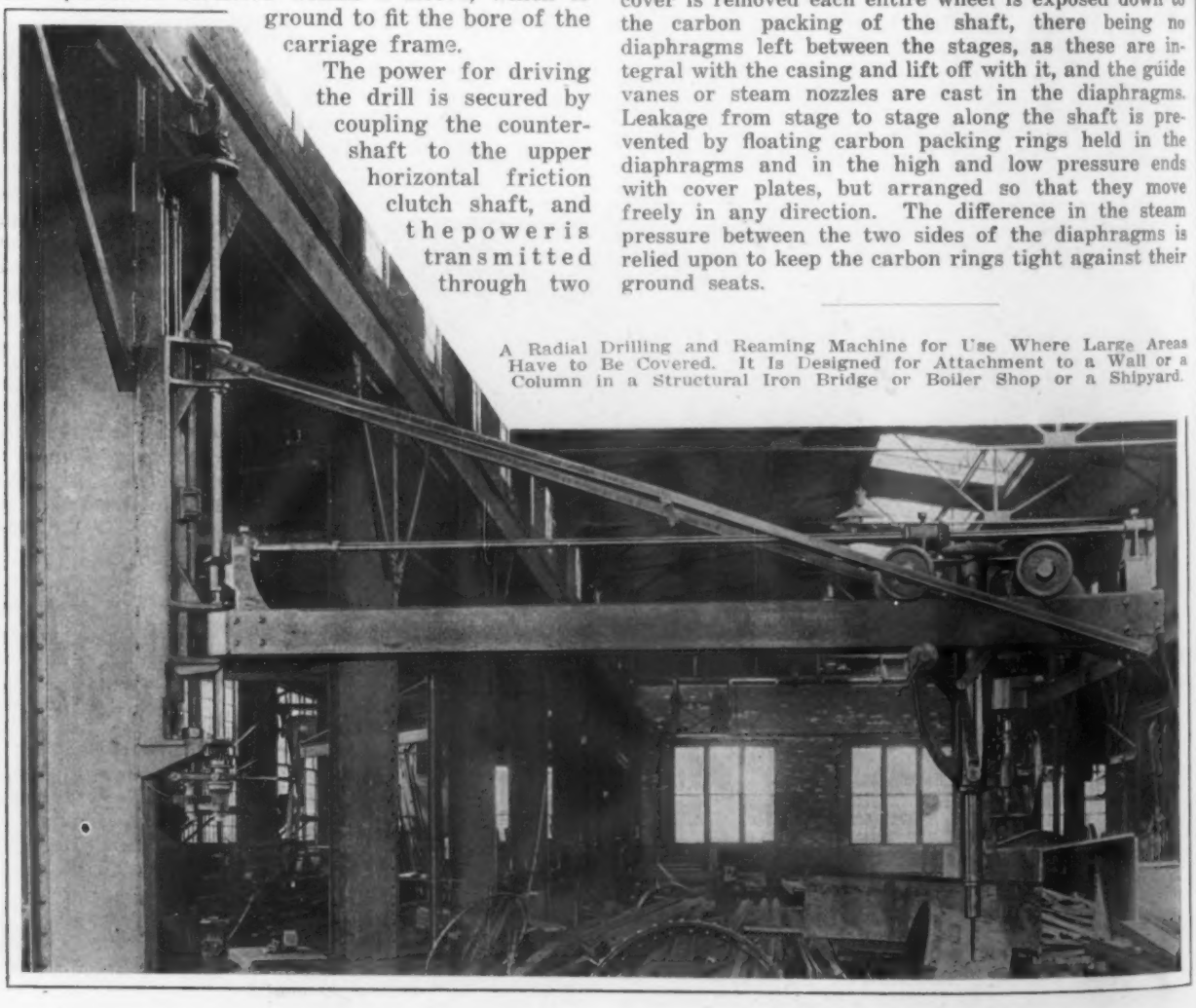
The power for driving the drill is secured by coupling the countershaft to the upper horizontal friction clutch shaft, and the power is transmitted through two sets of bevel gears to the upper end of the spindle.

The power feed consists of four geared changes in connection with a worm gear and friction clutch device. The hand feed is direct and is controlled by the large handwheel at the right of the spindle, which also acts as a quick return when the power feed is disengaged. When the hand feed is released, the spindle is automatically raised by the action of a counterweight.

The following table gives the principal dimensions and specifications of the machine:

Diameter of spindle in lower bearing, in.	1 15/16
Morse taper of spindle	No. 4
Vertical traverse of spindle, in.	15
Minimum feed per revolution of the spindle, in.	0.008
Maximum feed per revolution of the spindle, in.	0.069
Speed of spindle, r.p.m.	125
Minimum distance between wall and spindle, ft.	2
Travel of carriage, ft.	10¾
Vertical travel of boom, ft.	3½
Swing of boom, deg.	180
Power required, hp.	5
Speed of countershaft, r.p.m.	250
Over-all hight, in.	136
Over-all length, in.	187
Approximate weight, lb.	5,000

In an effort to make the machine a strictly one-man tool, all of the levers and handwheels have been brought within easy reach of the operator.



A Radial Drilling and Reaming Machine for Use Where Large Areas Have to Be Covered. It Is Designed for Attachment to a Wall or a Column in a Structural Iron Bridge or Boiler Shop or a Shipyard.

Larger Sizes of Multi-Pressure Stage Turbines

The Kerr Turbine Company, Wellsville, N. Y., is extending the line of multi-pressure stage turbines, which was illustrated in *The Iron Age*, June 6, 1912, by the addition of sizes between 700 and 1800 hp. Other changes have been made in the general design and construction to facilitate the handling of the larger parts. These include a horizontally split shell, which enables the rotor to be inspected or removed entirely without breaking the steam connections. When the cover is removed each entire wheel is exposed down to the carbon packing of the shaft, there being no diaphragms left between the stages, as these are integral with the casing and lift off with it, and the guide vanes or steam nozzles are cast in the diaphragms. Leakage from stage to stage along the shaft is prevented by floating carbon packing rings held in the diaphragms and in the high and low pressure ends with cover plates, but arranged so that they move freely in any direction. The difference in the steam pressure between the two sides of the diaphragms is relied upon to keep the carbon rings tight against their ground seats.

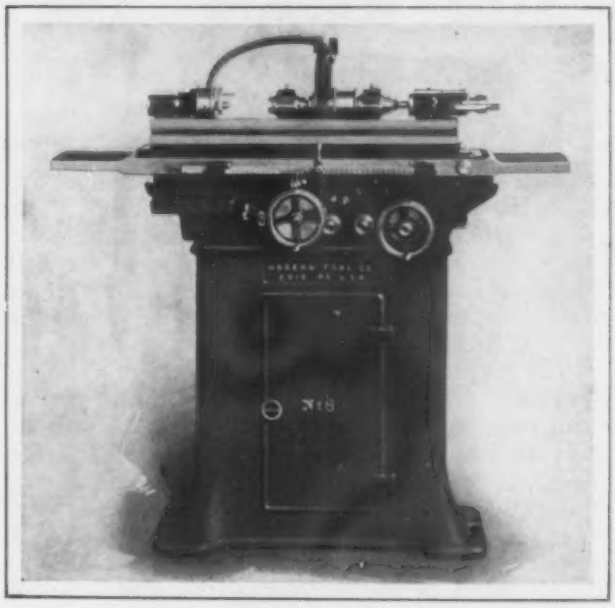
A Plain Manufacturing Grinding Machine

With a view to increasing the field of usefulness of grinding machines and lessening the cost of production, the Modern Tool Company, Erie, Pa., has brought out a small plain grinding machine designed for manufacturing purposes. This machine, which is designated as the No. 8 Modern type, has the same capacity and is very similar in general design to the company's No. 1 universal grinding machine. The value of the No. 8 plain machine is claimed to be greatly increased by the convenience with which it can be operated and cared for. The levers and handwheels are all within easy reach of the operator and all movements are controlled from the front of the machine. It will handle pieces 5 in. in diameter and 16 in. in length. The machine is stronger in general construction than the universal type, and possesses high power for rapid, accurate production. It is especially adapted for small, straight or taper, cylindrical grinding, such as armature and other small shafts, small rolls, and in fact any other work that can be done on a plain machine.

The wheel spindle is of tool steel hardened and ground and runs in Lumen bronze bearings having means for adjustment for wear and is designed to carry one wheel in the center for cylindrical grinding. The wheel stand is very strong to assure freedom from vibration. The cross feed is either automatic or by hand. An adjustable lever is provided for regulating the power feed. The automatic transverse feed has a range varying from 0.0002 to 0.002 in. for each reversal of the table and can be adjusted to any intermediate point. The cross feed can be set to feed at each end of the work, or if desired at one end only, this adjustment being made by a cut-out latch, with which the cross feed handwheel is provided. The automatic feed is thrown out when the work has been reduced to the desired size. By moving the controlling feed lever on the front of the machine from one notch to another on the dial plate the feed change is made without stopping the machine and the use of adjusting screws and dogs is eliminated. The cross feed handwheel is graduated on its bevel flange to correspond with the teeth on the cross feed dial which indicates the amount of stock the wheel is removing at each feed. A stop arm is provided for stopping the power feed at any predetermined point. When once set this needs no adjustment. A figure reading on the graduated handwheel is provided to indicate the necessary adjustment to compensate for the wear of the wheel.

The automatic sliding table travel is controlled positively by adjustable reversing dogs provided with screw adjustment operating against the reversing lever. To set the dogs the plunger is lifted out of engagement with the rack and the dogs are moved to the position desired, adjusting screws being used for setting to shoulders. The dogs are firmly held in position so that there is no danger of riding past the fixed position. The reversing lever, however, is provided with an attachment by the use of which the table can be run past the point of reversal without disturbing the adjustment of the reversing dogs.

Power is transmitted to the table through worm gearing, which is relied upon to give the smooth, even movement desirable in precision work. The V and flat ways on which the table slides are of extra width, giving larger wearing surface and are fitted with oilers, which keep the ways thoroughly lubricated. The table driving and reversing mechanism is non-self-centering and consists of gears



Front View of a New Plain Grinding Machine Designed Especially for Manufacturing Work

and clutches, simple in construction and positive in action. This mechanism is contained in a bracket bolted on the outside of the bed, which is easily reached for oiling, and may be detached by removing four bolts. Control of the sliding table is by a handwheel mounted on a sleeve that carries a clutch on its opposite end, which engages the table drive clutch. To move the table by hand the handwheel is pushed toward the bed of the machine so that it engages the table drive clutch. To engage the power feed the handwheel is drawn away from the machine toward the operator, this action disengaging the clutch. The sliding table has four changes of speed ranging from 22 to 78 in. per min. Control of all the working parts is centralized with a view to providing for convenience and rapidity in operation.

The swivel table has bearings on the sliding table and pivots on a large hardened and ground center stud and is clamped at both ends. It is graduated to grind tapers up to 2½ in. per ft. and is fitted with an adjusting screw at one end to give a fine adjustment. The base of the machine is a one-piece casting of generous proportions braced to insure rigidity and has shelves to hold small tools. The bed is bolted to the base and is cast integral with the water tank. The footstock spindle is of hardened and ground tool steel, and can be rigidly clamped to the barrel of the footstock in any position, or a spring may be used. The pump is of the submerged centrifugal type. The grinding wheel is 9 in. in diameter and its face is 1 in. wide. The machine occupies a floor space 32 x 68 in. and its net weight is 1400 lb.

Desulphurizing Coke

In a series of laboratory experiments, Skorédoff, as reported in the Revue de la Société Russe de Métallurgie, has found that if coke broken into small fragments be heated in a porcelain tube in the presence of a current of steam, about 44 per cent. of the sulphur present as ferrous sulphide and probably as calcium sulphide is eliminated when the temperature reaches 800 deg. C. The greatest evolution of hydrogen sulphide is during the first half hour, the remainder of the sulphur probably existing as sulphates. It is proposed to use the process at coke plants by passing superheated steam over the coke in closed receptacles and to recover the expelled sulphur.

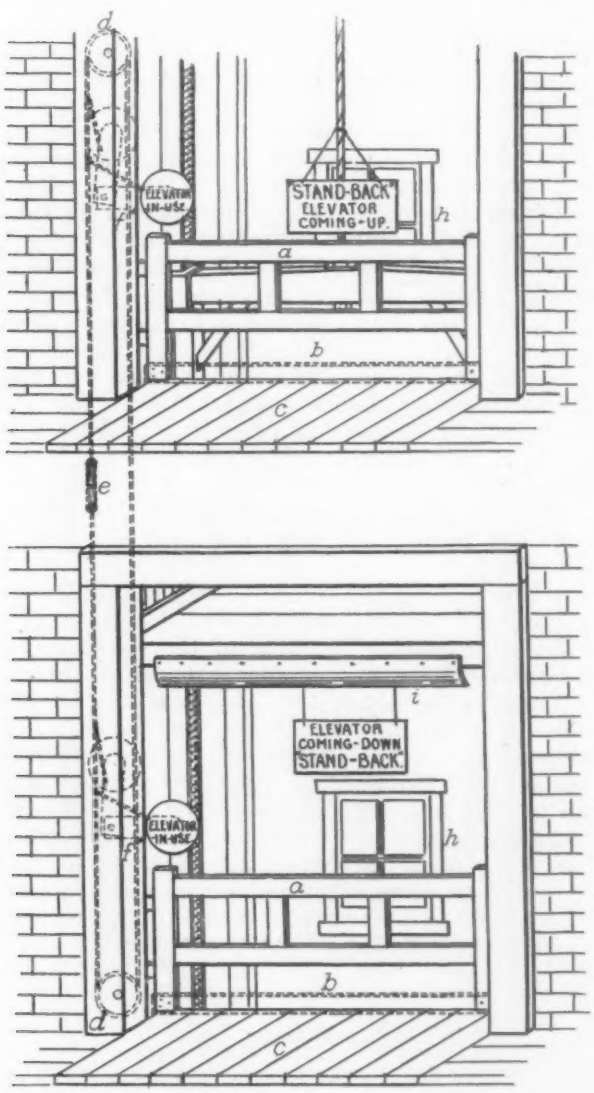
FREIGHT ELEVATOR GUARDS

A Proposed Arrangement of Gates and Warning Signals to Guard the Hatchway

BY JAMES E. COOLEY

Most of the accidents from freight elevators are caused by carelessness and are preventable. The greater number of these are fatal and those who recover from them are generally crippled for lite. Wherever attendants are employed to run freight elevators there are very few accidents, at least of the kind that are preventable.

The simplest industry uses one or more freight elevators. Most of these, especially the numerous small companies, employ no attendant to operate them because the elevator service is not large enough to warrant the expense of keeping an attendant constantly employed for this purpose. Where no particular person is designated to run a freight elevator the care of operating it is left to the judgment of the helpers and boys who do the trucking and other similar errands. Many of these



Sketch Showing an Arrangement of Gates and Warning Signs to Guard a Freight Elevator Hatchway

freight elevators are located on the side and end of the buildings, having an inclosed hatchway with entrances on each floor. It is generally at these entrances where most of the needless and distressful accidents occur.

It is a mistaken idea to think that the necessity for putting safeguards on freight elevators is solely for the benefit of that class of employed already mentioned, for, not only are these liable to accidents, but many times it has happened that foremen, superintendents and even members of a firm itself, have met their deaths in elevator accidents. Many of these freight elevators are not safely equipped or only partly so, as shown in the number of accidents that occur daily. A few safety ideas are given in the hope that they may serve to lessen the number of accidents from freight elevators.

For convenience an entrance to an elevator shaft is kept open during working hours, and is guarded with a wooden gate, which is lifted automatically when the elevator approaches the landing. The most common of these in use is recognized in the gates marked *a* on the drawing. The one fault in this type of gate is that there is nothing on it to prevent trucks, skid-rollers, crowbars and other material from rolling underneath it and down the elevator shaft. To prevent accidents from this source a board should be nailed across the opening at the foot of the gate, as shown in the dotted lines at *b*. As a further precaution a flooring such as is shown at *c*, should be laid and sloped away from the shaft. If then the gate should be opened for any special purpose, or even when lifted by the elevator, nothing could then roll off the landing. Since all floors in a factory are higher in the center and slope toward the sides of the building the necessity of laying a special floor at the elevator entrance is readily seen.

Another important point to consider in elevator service for which no adequate means are provided to prevent accidents is the setting the elevator in motion while workmen are in the act of loading or unloading it. Bells are chiefly used as warning signals for this purpose, the workmen on floors away from the elevator ringing a bell before pulling the cable. As the tendency in most cases is to ring the bell and pull the cable almost simultaneously, the workmen using the elevator do not get a chance to answer back before the elevator is started.

Other ways than ringing a bell should be devised so workmen can properly warn each other when the elevator is in use. A simple warning signal that can easily be made and set up in any elevator shaft is shown in the sketch. Two wheels or sheaves *d d* are fastened on the back of door casings as shown. Connected to these and extending along the length of the hoistway is a woven sash cord. The ends of the cord are fastened to a spring, *e*, which holds the cord taut. In back of each elevator entrance and at a convenient hight are hung movable wooden arms on pivots attached to disks bearing the words "Elevator in Use." These arms are attached to the sash cords by light chains or rods. Where it is desired to hold the elevator for any length of time, the workman simply pulls on the sash cord, which automatically lowers all the signals at each of the elevator entrances above or below him. The disks can be made of tin or sheet metal and should be painted red and the letters white. The signals are drawn up out of the way when not in use as shown by the dotted lines. A pin, *f*, in the wall acts as a stop when the signals are down.

Every elevator landing should be properly lighted in order to see where to stop the elevator. When it is possible to do so, an opening for a window should be made in the hoistway as shown at *h*.

Many workmen carelessly standing with their feet partly extended over the edge of elevator landings have had them badly crushed by the elevator. For preventing accidents of this kind a foot guard can be fastened to the front of the elevator as shown at *i*. This is made from a strip of sheet steel, 6 or 8 in. wide, having its lower edge bent under.

Should a workman's foot extend over the edge of the landing, the curve on the guard will strike his shoe first, and force it back sufficiently to clear the elevator.

A dangerous practice is, when workmen desire to use the elevator, to lean over the gate and look down the shaft and watch the elevator ascend. While so doing and before they can think to stand back the gate is suddenly lifted and the top rail strikes them in the face or under the jaw. Equally dangerous also is the habit of looking up to see where the elevator is, for it often descends almost at the same instant the head is put over the gate, generally with fatal results. To avoid accidents from these causes, two warning notices, similar to these shown in the shaft should be fastened one at the top and the other underneath the elevator.

It will be noticed that the heading "Stand Back," is placed first on the top placard and last on the lower one. This is done so that in whichever direction the elevator is moving between the floors, these two words will first greet the eyes and give ample warning to all who would use the elevator to stand away from danger.

FREE MATERIAL FOR SHIPS

Regulations Issued by the Treasury Department to Govern Free Entry of Foreign Materials for Building Ships

WASHINGTON, D. C., February 11, 1914.—The Treasury Department has prepared regulations for the enforcement of those provisions of the new tariff which grant free entry to foreign materials intended for use in the construction of vessels for the navy or merchant service built in the United States. The provisions referred to are as follows:

J. Subsection 5. That all materials of foreign production which may be necessary for the construction of naval vessels or other vessels of the United States, vessels built in the United States for foreign account and ownership, or for the purpose of being employed in the foreign or domestic trade, and all such materials necessary for the building of their machinery, and all articles necessary for their outfit and equipment, may be imported in bond under such regulations as the Secretary of the Treasury may prescribe and upon proof that such materials have been used for such purposes no duties shall be paid thereon.

J. Subsection 6. That all articles of foreign production needed for the repair of naval vessels of, or other vessels owned or used by, the United States and vessels now or hereafter registered under the laws of the United States may be withdrawn from bonded warehouses free of duty, under such regulations as the Secretary of the Treasury may prescribe.

The provision of the Panama Canal act superseded by the new tariff was as follows:

That all materials of foreign production which may be necessary for the construction or repair of vessels built in the United States and all such materials necessary for the building or repair of their machinery and all articles necessary for their outfit and equipment may be imported into the United States free of duty under such regulations as the Secretary of the Treasury may prescribe.

A WIDE RANGE OF DUTY-FREE MATERIALS

The regulations about to be issued by the Treasury Department are voluminous, but their principal features may be briefly stated. The restrictions on "materials" as to their purchase in the open market abroad and as to their not being constructed or fabricated upon a special order or after a special design, which were contained in the old regulations, are dropped. Materials may still be admitted free for use in the construction of a vessel or of its machinery, either in the condition in which it is imported or for manufacture for such purposes. The word "vessel" is defined as referring to the hull and everything permanently included therein or attached thereto except the "machinery," which word is defined so as to include only the propelling mechanism of the vessel. The effect of these definitions of the words "vessel" and "machinery" is the classification as part of the vessel of what was classified under the Panama Canal act as auxiliary machinery, such as pumps, steering gear, lighting plants, refrigerating plants, steam winches, hoisting engines, etc., which may now be admitted free of duty in their completed form, but which as completed machinery was denied free entry under the Panama Canal act.

The term "outfit and equipment" is given practically the same definition it had under the regulations of the Panama Canal act, namely, portable articles such as anchors, chains, cables, tackle, boats, repair parts, life-saving apparatus, nautical instruments, signal lights, lamps, furniture, carpets, table linen, table ware, bedding, arms and munitions.

REPAIRS OR RENEWALS NOT FREE

The free entry of articles to be used in the renewal or replacement of articles of the first or original outfit and equipment which were not permitted by the regulations under the Panama Canal act will be denied under the new regulations. Only original outfit and equipment will be admitted free of duty. For the purpose of repairs under subsection 6 the "vessel" is taken as a whole with all permanent attachments necessary or useful to accomplish the object for which it is designed, following an opinion of the Attorney-General dated March 20, 1909. This will permit the free entry under subsection 6 of all merchandise which is suitable and intended for the repair of the hull or for the repair or replacement of permanent attachments of the vessel, including its machinery, and which is necessary and useful in the navigation, operation or maintenance of the vessel. This will include not only so-called raw materials but in general completed articles, including machinery, either propelling or auxiliary, which are to be permanently attached to the hull of the vessel, and which serve the purpose for which the vessel was designed; but will exclude boats, sails, lamps, furniture, carpets, table linen, table ware, bedding, arms and munitions and similar articles of outfit and equipment.

The classes of vessels which do not come within the respective provisions of the two subsections are specified. Pleasure yachts not built for foreign account and ownership are excluded from subsection 5, and vessels other than those owned or used by the United States, not registered, are excluded from subsection 6.

At the request of the conference of collectors of customs held in New York, N. Y., it is provided in the new regulations that materials, etc., which are to be used in another customs district than that in which they arrived in this country shall be forwarded in bond to a port of the customs district in which they are to be used or manufactured. Duties are required to be collected on an excessive quantity of outfit and equipment that may be placed on board of a vessel. This is also a new provision in the regulations.

The Treasury Department prescribes that the new regulations shall take effect 30 days from their date as to articles made dutiable thereunder which were free under the regulations authorized by the Panama Canal act. As to all other articles, the regulations become effective forthwith. W. L. C.

GAS-FIRED FURNACE DESIGN*

Points on Tempering, Hardening, Annealing and Melting Installations

In hardening, annealing and tempering furnaces, we have to consider processes where a large amount of heat at a moderately low potential is required. It is therefore necessary to study carefully the various points that are essential to the proper design and construction of such furnaces. It must be remembered that this soaking process necessarily requires a big body of heat of uniform intensity. With regard to the annealing of brass and steel stampings, and small steel castings, it was at one time quite a prevalent idea among manufacturers that no such work could be carried out unless in a closed muffle, it being maintained that were such work carried out in furnaces of the oven type the oxidation of the material would be excessive. Such might be the case if furnaces fitted with air-blast burners were under consideration. With the development of the oven furnace fitted with atmospheric burners, however, all such ideas have long been exploded; and it is now an established fact that to obtain the best results the oven furnace must be used wherever possible.

THE OVEN FURNACE

In the oven furnace, with the bottom slab heated by the large flames from atmospheric burners, we obtain just the effect that is required by these soaking processes, the poorly aërated flame which partly envelops the work being an absolute necessity for the best results to be obtained. Further, if suitable arrangements are made to enable the amount of secondary air entering the furnace to be controlled, then the work can be carried out with a minimum of oxidation; for it will be understood that if such a furnace be run with the damper so adjusted that a slight back pressure is obtained, and if the amount of secondary air entering the furnace is only just sufficient for complete combustion of the gas, then the work is continuously sealed from the atmosphere by the products of combustion with which it is surrounded.

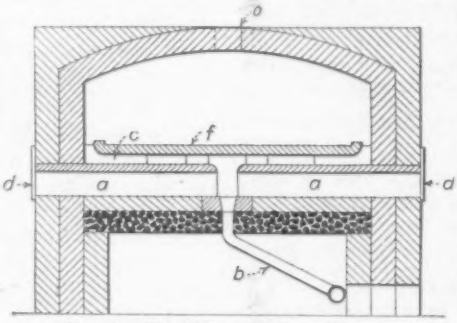


Fig. 1—Gas-Heated Oven Furnace

Fig. 1 represents a furnace of this type suitable for annealing purposes, and also for the tempering and hardening of steel, case-hardening and all such processes which require this soaking effect at any temperatures up to 1200 deg. C., this temperature being maintained quite easily with a gas pressure of 3½ to 4 in. water gauge. It will be seen that the burners, *b*, are arranged in a line entering the bottom of the furnace in the center. The whole of the secondary air being admitted through the flues, *a a*, and controlled by the dampers, *d d*, combustion takes place in the chamber, *c*, beneath the floor of the furnace, *f*, the waste gases passing into the oven itself through nostrils at the sides and finally entering the flue outlet, *o*. It will be observed that the secondary air flues, *a*, are so arranged that a considerable preheating effect is obtained; and although such a system of preheating may not be considered either as regenerative or recuperative by reason of the heat supplied to the secondary air not being abstracted directly from the waste gases, the net results obtained with such a system are, nevertheless, much the same, as a certain amount of heat is being continually transferred by means of the secondary air from the oven slab to the sides and roof, which results in a very uniform heat being maintained throughout the whole of the working space.

WORKING PRESSURES SUITABLE

As regards the working pressures suitable for this class of work, the results of a considerable number of experiments show that, disregarding for the moment the time taken for the preliminary heating up of the furnace, no advantage is obtained when working with pressures higher than 4 in. of water gauge. With this pressure, temperatures up to 1200 deg. C. can be maintained. The best results are obtained when the aëration is only just sufficient to allow of the required temperature being maintained—that is to say, the volume of the flame should be a maximum for the temperature required. Furnaces of this type are particularly suitable for the annealing of brass and steel stampings, where temperatures of from 800 to 950 deg. C. have to be maintained; also for the case-hardening of steel, where temperatures up to 1100 deg. C. are required. As regards case-hardening, it will be found that little or no carbon absorption will take place at temperatures below 900 deg. C.; the best results are obtained by soaking at as low a temperature as possible for a long period, rather than working at a higher temperature for a shorter period.

For normal carbon steels, it is usual to case at a temperature of about 1050 deg. C., quench when the required depth of casing has been obtained, reheat to a temperature of about 950 deg. C., and quench again finally in oil or water, according to the particular degree of hardness required. For the processes both of case-hardening and reheating this type of furnace is admirably suited.

THE REGENERATIVE REVERBERATORY FURNACE

Fig. 2 represents a section through a regenerative, reverberatory furnace, suitable for use with either low-pressure or high-pressure gas, the working pressure depending on the temperature required. It will be seen that the burners, *b*, are placed in a line entering the side of the furnace, and so arranged that the flame impinges on the arch; the waste gases pass over the work and thence into the flue outlet, f^1 situated at the bottom on the opposite side, whence they are conducted beneath the bed of the furnace into the main flue, *f*, giving up their heat to the secondary air, which passes through the flues, *a*, arranged alternately with the waste-gas flues beneath the furnace bed. It will be further observed that an auxiliary flue outlet, f^2 is provided. This is necessary to prevent any short-circuiting taking place when the furnace door is opened; the dampers being so arranged that when the furnace door is opened, f^1 is closed and f^2 opened simultaneously. Furnaces of this type are very suitable for any class of annealing operation where the work itself does not offer an obstruction to the flames, such as the annealing of plates or of stampings. Temperatures up to 1500 deg. C. may be obtained with a working pressure of about 100 in. water gauge. A similar design of furnace

*From a paper entitled "Notes on Gaseous Heating," by E. W. Smith and C. M. Walter, read before the Institution of Gas Engineers, England.

may also be adopted for the forging, welding, and hardening of high-speed steels.

THE MECHANICAL DESIGN

When considering the mechanical design and construction of gas furnaces, the conductivity of fireclay is of extreme importance. There are, of course, many factors to be taken into account when considering the question; but it will be easily understood that, in the case of small furnaces

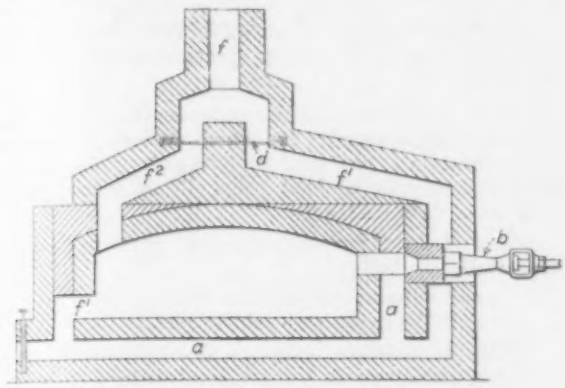


Fig. 2—Regenerative Reverberatory Furnace

which are used only during the day, and therefore require to be heated up to a working temperature each morning, the time required for this preliminary heating up will to a great extent depend upon the thickness and conductivity of the walls. In such cases the amount of brickwork should be a minimum; a 4½-in. brick, backed up by a good non-conductive material, well cased round, preferably with wrought plate, being all that is required. The lining, however, should be as non-conductive as possible, so that the radiation losses are reduced to a minimum.

In dealing with the mechanical construction of melting furnaces, it is most important that provision should be made for the bottom of the furnace to be so constructed that it can be removed and remade as expeditiously as possible, as the successful working of such furnaces depends to a great exent on the maintaining of the bottom free from spilt metal, which is not only liable to cause blocking-up of the burner passages, but also considerable damage to the furnace lining itself, owing to its fluxing effect with the firebrick. This arrangement may be very efficiently carried out by arranging for the bottom plate to be fitted with a circular cast-iron flange plate having the same diameter as the lining itself, this plate being held in position by two drawbars passing through projecting lugs cast on the underside of the bottom plate. On the top of this flange plate the furnace bottom is placed.

KIND OF LINING NECESSARY

The proper dimensioning of the lining is of the greatest importance if high temperatures, efficient working, and low metal losses are to be obtained, and it is generally determined from practical considerations. It may therefore be taken as a rule that the diameter should be sufficient to allow of a clearance of about ⅛-in. over the maximum dimensions of the pot tongs used, although in cases where the pots are not removed from the furnaces this figure can be reduced with advantage.

The hight of the furnaces is again to a certain extent determined from practical conditions, this depending upon the nature of the metal to be charged. To obtain the minimum metal loss, however, there should be at least a depth of 6 in. above the rim of the pot in the case of furnaces up to 80 lb. pot capacity, and of 10 in. in the case of the larger pots, the bottom of the flue outlet being slightly higher than the rim of the pot.

Burners should be arranged to enter the furnace tangentially to the annular space between the pot and the lining, and fixed on opposite sides where possible. For small melting furnaces up to 80 lb. pot capacity a single burner will suffice. In the case of the larger sizes, however, two or more burners should be used, placed on opposite sides.

Troubles with Manganese Steel

Some of the difficulties attending the production of rolled forms of manganese steel were referred to in the article in *The Iron Age* of January 1, 1914, on "Progress in Alloy Steels at South Chicago." In view of what was said in that article, special interest attaches to the following by a member of the Illinois Steel Company's staff at No. 2 open-hearth works at South Chicago, written for the paper circulated there known as the South Works Review:

When the manganese proposition first came up, some time ago, we little realized how hard would be the jolts acquired on the thorny path that has finally led to some degree of success. On the first attempt cold manganese was put in the bath, but would not melt without burning the roof. So the next time it was put in a ladle and preheated by means of an oil burner. Mr. Devaney and Mr. Kilduff came out at 3 o'clock of a zero winter morning to make sure that no time was lost getting the supposedly hot manganese from the ladle into the furnace. While transferring it a piece fell on the floor, which a second helper picked up. Yes, it was almost warm in spots, and the oil flame had been on for six hours previously. Fine business—not! There was nothing to do now but get liquid manganese and all was lovely. There was one slight objection to this, however—namely, that each heat required a new furnace, as the reaction did not leave much of either the bottom or the roof. Step number four was to pour the liquid manganese in the ladle direct. Trouble and more trouble! The heats were so hot that it was impossible to prevent a running stopper and the pit and molds were a beautiful mess after each heat. This was finally overcome by using a 1½-in. nozzle and cooling with rail ends. As soon as we really commenced to turn out a few ingots, left handed compliments came thick and fast. We were making some of the most beautifully piped ingots you ever saw. A number of experiments were tried in overcoming this feature. One, after pouring all the ingots, was to go back over them again and fill the tops of the molds with the slag that was left in the ladle. The idea was to keep the steel hot and let the pipe fill up. The cutting effect of the slag was fine on the ladle and didn't hurt the pipe very much. The next step was a stroke of genius. One of Reilly's "teakettles" was brought over and after pouring the ingots the teakettle was filled with steel and the molds gone over again. Words will not come when I attempt to describe the iniquities of that insignificant little ladle. Let it suffice to say that the troubles of before were nothing in comparison.

This brings us down to the present and apparently our troubles are mostly over. The system now consists of using inverted molds with refractory tops, putting carbon on top of the ingots after pouring, and keeping it in a state of incandescence with compressed air. This works fine, for which we give due thanks.

The Standard Aluminum Company, Two Rivers, Wis., has been obliged to institute a 24-hour workday schedule in order to cope with orders, which are of such volume as to make day and night operation imperative for at least six months. It is therefore likely that extensions will be made during the last half of the year.

PROTECTION OF DESIGNS

A New Registration Measure Which Will Remedy Present Defects

WASHINGTON, February 7.—An important bill, having for its purpose the protection of original designs for manufactured products at a minimum cost and without delay in registration, has been introduced in the House by Representative Oldfield, of Arkansas, and referred to the Committee on Patents. It has the hearty endorsement of Commissioner of Patents Ewing and it is believed the House Committee will report it favorably at a comparatively early date. An identical bill has been presented in the Senate, which will enable the Senate Committee on Patents to consider the measure in advance of action by the House.

The Oldfield bill is a constructive piece of legislation for the protection of industrial property, the need of which many industries have long felt. It is in the interest of honest business and fair trade and against business pirates and parasites. The chief defect of the present law is that it contemplates that the subject matter of every design patent must be an "invention" and every application for the protection of a design is subjected to a careful examination to determine whether or not the design discloses an invention. In other words, substantially the same rules for examination to determine the right of a manufacturer to register a design for use on his goods are applied as are used in the case of a mechanical invention. Very few designs present the absolute novelty of inventions and therefore only a relatively small number can stand this test either in the Patent Office or in the courts. The Oldfield bill proposes to recognize a copyright in such designs and simply makes unlawful the copying of the original design for the particular article of manufacture upon which it is used. Instead, therefore, of a delay of several months for examination in the Patent Office, with a strong probability of rejection, the design is registered promptly for a nominal fee, as in the case of copyrights for works of art. The pending bill does not presume that the particular ornamentation or the particular design must be new and original in itself; that is, as separated from the manufactured product in which it is embodied or to which it is applied. For example, it will not be sufficient to invalidate a registration for a new design intended to be employed upon a stove or a furnace to show that a similar design has been previously used for a piece of silverware, such as a sugar bowl or water pitcher. The bill proceeds upon the ground that the designer can create a stove or a furnace of a new and original design as such, notwithstanding the condition of the art in silverware.

An important provision of the bill is that registration of a design shall not create any estoppel or abandonment of any trademark rights. Many designs by long use become valuable as trademarks, inasmuch as they identify the origin of the products. Registration of such designs under a law such as this bill proposes would not work an abandonment of such rights on the expiration of the design registration.

The greatly simplified procedure under the Oldfield bill is illustrated in the fact that it provides that registration may be obtained without examination, except as to form. Where conflict of interest develops, the controversy can be settled subsequent to registration in court proceedings, while immediate protection is given under the registration law, and at a nominal fee. The government fees proposed are $1 for a three-year term; $10 for a ten-year term, and $30 for a twenty-year term. Procedure in the courts is made as simple as possible. Expense and litigation are saved by a provision for certifying the record or decree in one United States Court to any other United States Court and making the same a basis of an application for injunction in the other court.

CLASSES OF DESIGNS

A classification of designs for the purpose of protection is provided by Section 25 of the bill as follows:

Section 25. That for the purposes of this act and to indicate some products for which designs are expressly recognized as registrable hereunder, manufactured products may be divided primarily into the following classes of arts or trades:

Class 1. Machines and machine parts not otherwise classified.

Class 2. Stoves, ranges and heating apparatus.

Class 3. Vehicles and vehicle parts.

Class 4. Textiles, including print cloths, laces, nets, veilings, embroideries and other trimmings or ornamentations for apparel, drapings, hangings, furniture mats and coverings other than those in class 5.

Class 5. Floor and wall coverings.

Class 6. Furniture of all kinds.

Class 7. Type faces, electrotypes, borders, ornaments and cuts of all kinds intended for printing, lithographing or other use in the graphic arts.

Class 8. Clocks, jewelry, decorative "art goods," including vases and bric-a-brac, bronzes, silverware, tableware and glassware not otherwise classified.

Class 9. Lamps and lighting fixtures of all kinds, including globes and shades, plumbing fixtures, bathroom fixtures, builders' hardware and trimmings.

Class 10. Packages, including bottles, jars and other containers.

Class 11. Pictorial designs, including postcards and other commercial prints, lithographs, and so forth, not registrable under the copyright act.

Class 12. Miscellaneous, under which registration rights shall be limited to the specific product named in the certificate.

Patent experts are substantially a unit in support of the measure. In commenting on the bill Commissioner Ewing said to the correspondent of *The Iron Age:* "It affords me pleasure to indorse this measure, which is in the interest of fair trade in all industries. I have made a few suggestions to Mr. Bradford of the Washington patent bar, who has been chiefly instrumental in drawing the bill, and they have been incorporated in the measure. The passage of the proposed law would be a long stride forward and I trust Congress will not delay in giving us a workable design registration law for the benefit of honest and enterprising manufacturers and dealers in all industries." W. L. C.

A rolling mill engine of no less than 25,000 hp. has been built for the South Durham Steel & Iron Company, Ltd., at the Middlesbrough works of Richardsons, Westgarth & Co., Ltd. The engine is to drive a plate-mill at Stockton-on-Tees, and is of the three-crank vertical type with three cylinders, each 54 in. in diameter and 60-in. stroke. The engine is to be operated non-condensing with steam at 160 lb. pressure supplied to all three cylinders. The maximum working speed is 80 r.p.m. and the engine is direct connected to the mill. The engine builder has also constructed for the steel plant a hydraulic plate shear capable of handling plates 138 in. wide and 2½ in. thick. The shear lever is actuated by one to four hydraulic cylinders, according to the work to be done. The steel plant will also include a 500-ton metal mixer.

BLAST-FURNACE GAS AS A FUEL

Experience in Russia in Applying It to Open-Hearth Furnaces

The operation of open-hearth furnaces with blast-furnace gas at Nadjeschdinsky-Zadow, Russia, is discussed by W. Worobiew, steel works superintendent, in Stahl und Eisen for December 4, 1913. After a careful discussion of the subject, and calculations based on the gases at his disposal, he sums up the separate points for the successful operation of open-hearth furnaces with blast-furnace gas as follows: The gases must first be thoroughly cooled. An increased consumption of gas is necessary and therefore increased regenerator space. The usual ratio of gas and air regenerator capacity must be changed. The gas checkers must be the larger, and this is particularly important when using coke blast-furnace gas. Tests were carried out with a 50-ton furnace of the following dimensions:

Length of hearth	34 ft. 5 in.
Width of hearth	12 ft. 6.in.
Gas regenerator	2825 cu. ft.
Air regenerator	3178 cu. ft.

This furnace was built to use producer gas, which is the reason the dimensions do not correspond with the four requirements given above. The blast-furnace gas is given the usual rough cleaning and forced by a fan through a long main. It enters the open-hearth gas valve at 25 deg. C. This fan allows the pressure to be regulated, and also the volume of gas supplied to the furnace. The heating value is about 120 B.t.u. per cu. ft. The furnace was started before the plant was completely equipped, so that for a time cold charges of only 30 tons were worked. During the first month wood producer gas was used of about 210 B.t.u. per cu. ft. This heat value was calculated from the analysis, which does not take into consideration a high moisture content of 78.6 grains per cu. ft.

After the blast-furnace gas main was built the furnace was changed over while the blast furnaces were using a mixture of wood and charcoal. The following results are given:

Month	Output, metric tons	Working days	Fuel
July	1870	25	Producer gas
August	2705	28	Blast-furnace gas
September	2517	29	Blast-furnace gas
October	2640	29	Blast-furnace gas
November	1460	17½ (repairs)	Blast-furnace gas
December	1840	25 (repairs)	Blast-furnace gas

Later the blast furnaces went on charcoal alone. As the steel works in the meantime had been provided with an electric crane, the charge was raised to 50 tons, and consisted of 65 per cent. hot metal and 35 per cent. scrap. The daily output was 125 to 135 metric tons, and no essential difference could be noticed from the results obtained when wood and charcoal were being used in the blast furnaces. The temperature of the bath taken with a Fery pyrometer was 1650 deg. C., the same temperature being found with the other furnaces using producer gas. Careful measurements showed that 90 to 95 cu. m. of blast-furnace gas were being burned per min., a similar furnace showing 80 to 85 cu. m. of producer gas. It is evident that more blast-furnace gas was being consumed, which was to be expected.

The success of these tests pointed out methods for economical practice. The second new 50-ton furnace, which was started last April, was built without producers. More recently the proposition has been advanced that all the open-hearth furnaces should use blast-furnace gas, and the producers be shut down. The advantages following the use of blast-furnace gas need not be specially emphasized. The outlay for the producer plant, for its operation and maintenance, for the gas mains, etc., will be altogether done away with.

The question of the use of coke-blast-furnace gas for operating open-hearth furnaces still remains open. Unfortunately no tests could be made along these lines because no coke furnaces were working at Nadjeschdinsky. It is believed, however, that the above considerations would hold good for such practice, and that, with the use of available technical methods, good results would be obtained. G. B. W.

BOOK REVIEWS

Foundry Machinery. By E. Treiber. Pages 139, 5 x 7½ in. Illustrations 51. Published by Scott, Greenwood & Son, London, England. Agents in the United States, D. Van Nostrand & Co., New York. Price, $1.25.

This is a German work translated and adapted to British practice by Charles Salter. It describes the mechanical appliances employed in the foundry to supplement or replace hand labor. The chapters discuss in order: Machines for preparatory treatment of molding material; molding machines; hand molding machines, both simple lift-up and turnover-plate; molding presses; jig molding machines; special molding machines; core molding machines; pneumatic rammers; fettling machines. In the appendix a number of machines and appliances are described which, though not used exclusively in foundry work, have been more or less especially modified for this purpose, such as hoisting and conveying appliances. The treatment is clear and concise, and the book is instructive to American foundrymen, both steel and iron, since the principles embodied in the corresponding forms of equipment used in this country are the same.

Practical Pattern Making. By F. W. Barrows. Pages 347, 5¼ x 7½ in.; cloth. Second edition, revised and enlarged. Published by the Norman W. Henley Publishing Company, New York. Price $2.

The substitution and addition of new matter are evident. The first edition was reviewed in *The Iron Age* of February 1, 1906. The chapters cover pattern makers and pattern making, material and tools, wood patterns, metal patterns and cost, care and inventory. Of special interest in the new matter is the description of patterns as adapted to molding machines, and ways are pointed out of overcoming many difficulties which have hindered rapid development in this field. It is a practical treatise by one who is himself a pattern maker and offers much that is of value to all who are coming forward in that field, especially to the younger men.

Metal Statistics. Published by the American Metal Market and Daily Iron and Steel Report, New York. Pages 287, 4 x 6½ in.; cloth. Price, 50 cents.

This seventh annual edition of Metal Statistics exceeds in size and value any of its predecessors, and the publication had already made a large place for itself. The statistical tables heretofore given, which cover production and prices of iron ore, pig iron, finished iron and steel, scrap, coke, copper, tin, lead, spelter and other metals have been enlarged and rearranged. The volume has become an important institution in its field. The editors are, as heretofore, B. E. V. Luty and C. S. J. Trench.

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Regulation by Commission

Public sentiment in favor of regulation by commission is undoubtedly stronger than ever. The impression has obtained lodgment in the minds of perhaps the majority that the time has passed for freedom of action to be permitted in the conduct of enterprises which affect any considerable part of the public. From the manner in which national and State legislative bodies are considering the extension of this method of governing actions of individuals, it will be broadened instead of curtailed.

With much to commend the general principle of regulation of public utilities, common carriers, large corporations doing an interstate business, etc., it is unfortunate that the various commissions which have so far been constituted have so generally developed into bodies of slow movement. Great problems are steadily coming up for solution by these commissions, and the more important these questions are the more likely are they to be held indefinitely for investigation and decision. It does not seem necessary, even in cases of serious importance, that all details should be inquired into. General facts exist which have an immediate bearing on a question and the consideration of minute matters could well be passed by. If the members of a commission are not in favor of granting a request made by railroad corporations over which they have control, a decision should be rendered without any great delay, instead of continuing to throw out drag nets for further information which make it appear as if the desire existed of clouding the main issue and finding sufficient ground in minor matters for making an adverse ruling. The same thing applies to questions which come up from time to time before commissions having power to regulate public utilities. Applications for permission to do various things are too frequently held up so long that the exigency sought to be provided for passes by without the securing of the desired remedy.

The question naturally arises, in view of these conditions, whether this country would have made its great material advance of the past quarter of a century if commissions had existed from the earliest times and had steadily balked the projects brought forward by enterprising and aggressive business men. It would appear as if the wheels of progress must invariably have moved much more slowly and the country have been checked seriously in the development of its great resources and in the building up of its admirable system of transportation and effecting its magnificent triumphs in engineering. Those who are now favored with membership on public commissions should feel that they are not only charged with the necessity of guarding against improper actions of officers of corporations but that they are also given a much more important duty to perform. This duty is to endeavor as far as possible to assist in the development of proper corporate activities by rendering timely decisions. In the event of an adverse ruling the managers of large enterprises would then probably find some other way for the early and proper development of the interests of which they have charge.

The Industrial Railroad Decision

As Commissioner Harlan remarks, the importance of the industrial railroad case can not easily be overstated. So multitudinous are the relations between the trunk lines and the industrial railroads covered by the decision of January 20 that the commission was unable to make anything like a complete statement of the amount of money involved, though numerous statements of the precise pecuniary value of certain services or certain allowances are made in the decision, in specific cases. At the conclusion, however, the decision says that the amount "has been estimated at not less than $15,000,000 a year, and this we regard as conservative."

The decision very lightly, but perhaps effectively, clears away much of the ground upon which divisions to industrial railroads might be justified, by hinting that practices in the case of other shippers, not possessed of such railroads, may have to be modified. This refers to the "spotting" of cars, a service which is ordinarily performed by the railroad on a siding, whether the siding belongs to the railroad or to the shipper. One of the claims of the industrial railroads has been that since they are entitled to this spotting, an allowance is due them from the carrier if they do it themselves. Probably the most radical item in the whole decision is the attitude assumed by the commission in this respect, for it says with regard to "spotting" that all services of that sort "are what may be called volunteer services in the sense that they are in addition to the main-line haul and in excess of any obligation of service by the carrier at common law." Admit-

ting that the custom is of long standing, the commission calmly states that the carriers "may be required" to do this spotting, but quietly adds the phrase "upon reasonable compensation." The significance of this qualification should not, of course, be overrated. The language, however, is not altogether clear, inasmuch as reference is later made to the same thing in the words "reasonable compensation included in the rate itself or set up in the form of a special charge."

Of course, the contention of the industrial railroads all along has been that the compensation is in the nature of things already "included in the rate itself." The inference is that the commission desires to leave the way open to establish different charges in accordance with the expense involved in "spotting." In other words, the larger the plant, the more wholesale the business which the shipper gives the railroad, the more the latter may be entitled to charge per carload for handling it, since it naturally follows that the larger the plant the farther from the various shipping and receiving points must be the single "point of interchange" which the commission desires to establish as the point at which the railroad service, under the open rates, must begin or terminate.

It was announced several years ago that the commission intended to make a complete investigation of the allowances to industrial railroads, but the decision now rendered is based in an enterprising manner upon a later development, which is referred to in the following extract:

> As we have heretofore stated, these matters were voluntarily brought to our attention by a joint committee of the trunk lines and the Steel Corporation and were submitted for our consideration on the understanding that the conclusions reached would be accepted both by the carriers and by the industries. Under these circumstances it seems to be unnecessary at this time to enter an order; we assume that the trunk lines and the industries will at once adjust their practices in conformity herewith. We are warranted also in assuming that there will be no effort, through trackage rights and similar devices, to continue in another form the relations which we here declare to be unlawful.

The "practices" declared unlawful include the following: divisions out of the rate, per diem reclaims, remission of demurrage and furnace allowances. The divisions were apparently the least common, being given chiefly to very large industries. The matter of per diem reclaims has possibly been not entirely settled, though it was partly settled before the decision, by an understanding of date January 1, 1914, through which reclaims would no longer be made. Under the "modified agreement" made some time ago, the switching or terminal line is under a charge of 45 cents for each day that a car is held on its rails, while individual arrangements are made as to the number of days of free time allowed, generally from three and a half to five and a half days. The arrangement had been such that frequently the industrial railroad was able to collect cash from the carrier by averaging less than the free time allowed. The arrangement of January 1 simply makes it that per diem reclaims "will no longer be a source of revenue to the industries." This, however, leaves the industries free from demurrage, inasmuch as the practice has been that the industry pays the demurrage, when the time exceeds the 48 hours allowed in the tariffs, not to the line carrier but to its own railroad.

From a careful reading of the decision's reference to the six industrial railroads which had been classified as "real railroads," it appears that their exemption from the general declaration as to illegal practices is one of form and not of substance. A list of the other industrial railroads is first given, and the decision against their operations is sweeping; then the six individual roads are taken up and each is handled in much the same manner, so that there is really little distinction.

The commission insists that the industrial railroad is purely "a plant facility" and nothing more. It is only the scope of this statement, not the fundamental principle, which the owners of industrial railroads could question. Their position has been that while their line performed plant services it also performed services which should properly be performed by the line carrier or at its expense. The commission seems to regard as conclusive evidence the fact that in at least some instances the allowances from line carriers are sufficient to pay the entire operating expenses of the industrial railroads, including the plant services rendered, and does not undertake to show that the industrial railroads are not entitled to make a profit out of their portion of the service, as the line carriers do out of theirs. In this respect the decision does not seem to be altogether adequate. Legally, however, it may be, on the strength of the "commodities clause."

While the industries affected were given a great surprise by the sweeping nature of the decision, it seems rather improbable that the effect will be less important than is indicated. In other words, there will be such a change that the industries will have their revenues decreased by many millions of dollars annually, while the line carriers' revenues will be correspondingly increased.

The large iron and steel plant has been a rapid development and the extent of the saving to be effected by manufacturing on a very large rather than on a relatively moderate scale has been much discussed. The decision operates to reduce the advantage of the large plant, whatever that advantage may have been. Inasmuch as there are various disadvantages, as well as various advantages, in large-scale operations, the change is one of degree and not of substance.

The prohibition of "spotting," except with an extra charge, is a remarkable one from any angle, and the suggestion that all "spotting" might be charged for, even, as we understand it, in the case of a small plant located on a siding owned by a railroad, is obviously quite radical. It recalls a suggestion made many years ago, when the large office building first made its appearance, that the Postoffice Department did not admit in theory its obligation to deliver mail to each individual tenant in the building; to the private residence it delivered mail matter at the front door; why not also to the front door of the skyscraper? The point was not pushed in that case, but if the point as to spotting cars is pushed some complications are quite likely to be developed.

A New Profit-Sharing Plan

Profit sharing in its original form, by which, at the end of a given period the employer gives his employees a dividend on the investment, has been tried in not a few cases in this country and abroad. A certain degree of success has been achieved in some instances; but as a rule the idea has been considered a paternalism in some degree obnoxious to those it is intended to benefit. A given amount of the profits is distributed among the workmen, regardless of individual efficiency, excepting at times as it may be indicated by their daily wage rate. The Farr Alpaca Company, Holyoke, Mass., has just announced a plan which will be carried out in the current year. The employees will be given a dividend on their total wages for the year, at the same rate as that paid the stockholders. Some of the details are given in a statement issued by the company, from which the following is taken:

The plan is to pay a wage dividend to all employees who start the year on the company's payroll and remain with it throughout the year. The only condition of participation is satisfactory service. Upon each $100 earned by an employee entitled to participate a dividend will be paid at the same rate as is paid a shareholder upon a share of stock. That is, on the basis of 8 per cent. dividends stockholders would receive $8 on each $100 invested with the company and employees would receive $8 as a dividend on each $100 received by them in wages during the year.

If an employee leaves the service of the company or is discharged before January 1, 1915, he will forfeit all claim to share in the year's dividend, but this will in no way advantage the company for the amount lost to such employee will be passed to a benefit fund, from which assistance may be granted by the company to disabled and aged employees. This is one instance in which the Farr plan is generous beyond the plans usually tried.

It will be seen that the plan adopted is not only easily understood by the worker, but certain in its operation. It is not based, as many plans have been, upon a question of how much the company has made in profits. The workman often finds it impossible to ascertain that fact, and where that is the measure of the workman's dividend suspicion and trouble often follow. In this plan, dividends to stockholders will probably be declared every three months. What those dividends are is common knowledge. The company employs upward of 3000 persons and it pays out annually in wages not far from $1,800,000. This profit sharing would result in increasing the income of the 3000 employees for this current year by about $144,000. This is 25 per cent. of what the stockholders themselves would receive in cash on the 8 per cent. basis. The plan, therefore, amounts to admitting to a one-fifth partnership in profits—but not in losses—the company's faithful and steady employees.

Hardly less important to the community is the action of the company at the annual meeting in increasing its capital stock from $2,400,000 to $7,200,000. The new shares are to be divided among the stockholders in what is commonly called a stock dividend.

The plan is a generous one as compared with most of those heretofore followed. Comparisons may be made, however, with the results of the premium on the bonus system. The Farr idea might be combined with one of the newer wage systems in a way that would come nearer the ideal than either singly. Under these systems the workman is guaranteed a daily wage and a share of whatever saving he may make in the time allowance for a given task. He is working for himself. His employer makes the unbreakable rule that whatever the agreed time or rate may be it shall not be changed.

To consider the Farr plan in comparison with the bonus system, the question is which would the workman prefer. In the one case he will receive, supposing his wages amount to $600 a year, $48, providing that he retains his position and also that the company earns a sufficient amount to give him and the stockholders the expected 8 per cent., corresponding to the 24 per cent. heretofore earned on one-third the present stock issue. On the other hand, under the bonus system a man gets the extra return for his effort every week. In every instance of bonus or premium system which has come to the attention of the writer, the average return to the employee, on a piece price basis somewhat lower than that which had prevailed in the same works, figuring on the daily wage system, has been considerably above 8 per cent. Another consideration is that the workman feels himself a free agent. He is competing against his own previous production and against that of his fellows in the shop.

The Farr Alpaca Company's plan is wholly commendable and goes beyond what has been attempted in the textile industry, with rare exceptions. On the present dividend basis the corporation will distribute a very large amount of money. Joseph Metcalf, the active head of the company, and one of those who organized the business 40 years ago, is the father of the plan, to which he has given a great deal of careful study. The conditions in his mills may be such that no other system would serve the purpose so well. Each industry has its own problems to meet, and it would not be fair to criticise what has been done in this case without a very careful analysis of the situation. An interesting experiment would be the creation of a system under which a premium plan would be adjusted to work with a strictly profit-sharing plan. The inducements to permanent employment would be twofold.

New York Harbor Steel Projects

New York City newspapers have been calling attention prominently in the past week to various indefinite steel works projects involving New York harbor locations. The industrial bureau of the New York Merchants' Association is mentioned prominently in these articles. Inquiry of those who have been canvassing the New York harbor situation for a long time, and who are well informed as to developments, shows that absolutely no late steps have been taken looking to the building of blast furnaces or steel plants on the water front in the metropolitan district. Reference was made in these columns in October, 1913, to the Witherbee, Sherman & Co. blast furnace and coke oven project on which considerable preliminary work has been done, and this is again spoken of in the daily paper articles. The options in this case, on lands on the west shore of the Kill von Kull, between Perth Amboy and Sewaren, N. J., run until October, 1914, and no definite decision is likely to be made for some months.

Charles M. Schwab and the Bethlehem Steel Company have been again named in connection with a seaboard steel plant in the reports of the past week. The basis for this statement apparently is the plan that has heretofore been mentioned, to establish ore receiving docks in New York harbor for ores imported by the Bethlehem Steel Company. These docks would probably be located on New Jersey terminal property of the Central Railroad of New Jersey or the Lehigh Valley Railroad.

British Iron and Steel Exports and Imports in 1913

The exports of British iron and steel for 1913 show an increase over those for 1912, but it is not large. The total sent abroad for the year, excluding iron ore and including scrap, was 5,050,919 gross tons, as against 4,933,112 tons for 1912, an increase of 117,807 tons. In value the increase is £5,733,469, the total exports for 1913 being valued at £54,729,302 as compared with £48,995,833 for 1912. The decrease in pig-iron exports continues, the total, including ferroalloys, being 1,124,815 gross tons for 1913, as compared with 1,262,383 tons for 1912. Of galvanized sheets the exports were 762,244 gross tons for 1913, as against 658,650 tons for 1912, an increase of 103,594 tons.

Iron and steel imports for 1913, excluding iron ore and including scrap, show an increase of 282,757 tons, totaling 2,343,709 tons, as compared with 2,059,952 tons for 1912. The values for the two years are £15,618,031 and £13,153,247, respectively.

It is stated that had 1912 been a normal year, one not marked by exceptional labor trouble, 1913 would probably have compared unfavorably with it in total exports, which partly explains the small increase. While pig-iron exports showed a decrease for the year, and were smaller than in any of the four previous years, ferromanganese showed an increase in 1913, the total (with spiegeleisen) being nearly one-third in value of the total classified under pig iron. English comment is that the recent entrance of the Steel Corporation into this market will result in a decreased demand for ferromanganese in the future.

In manufactured iron and steel the exports were considerably larger than in any previous year, particularly as regards sheets, which were about 38 per cent. of the total exports. The increase of 100,000 tons in galvanized sheets was noteworthy. Exports of rails for 1913 were over 500,000 gross tons, a figure that has been exceeded only three times in the past ten years. The imports of iron ore were 7,442,000 tons, against 6,600,000 tons in 1912, a figure exceeded in only two or three previous years. In manufactured iron and steel the total imports for 1913 were 2,000,000 gross tons as against 1,779,000 tons in 1912. The remarkable fact about the import figures is that semi-finished and finished material, excluding pig iron, now amount to over 50 per cent. of the semi-finished and finished exports.

The Cobalt Steel Case

The patent office in Berlin, Germany, has just granted without restriction the full patent applied for by the Becker Steel Works of Willich, Germany. It relates to the manufacture of high speed steel containing cobalt up to 15 per cent., in addition to alloying metals such as chromium, tungsten, molybdenum, vanadium, etc. All the principal continental manufacturers opposed the grant, but were overruled. Cobalt steel was patented in Great Britain by the Becker firm and was not opposed. Though its cost is higher than that of ordinary tool steels, it is being used in a number of engineering works in Great Britian, on the continent and in the United States.

The Southern Supply & Machinery Dealers' Association will hold its annal convention in Houston, Texas, April 9, 10 and 11. The chairman of the hotel committee is Charles D. Golding, Peden Iron & Steel Company, Houston, to whom all requests for hotel reservations should be made. A programme of mutual interest to jobbers and manufacturers has been arranged.

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Explosion in a New Jersey Iron Mine

At the Washington mine of the Empire Steel & Iron Company at Oxford, N. J., Friday night, February 6, an explosion occurred on the seventh level, which will considerably reduce the output of iron ore for about 10 days. The night shift was at work at the time, but no one was injured. The cause of the explosion is not definitely known, but one theory is that it was due to the gas formed by the decomposition of pegmatite rock in which are both carbonate of lime and magnesia. The Washington mine has one of the largest deposits of iron ore in New Jersey. It has been producing about 10,000 tons a month of ore running over 60 per cent. in metallic iron, for the nearby Oxford furnace, which produces basic pig iron. The stock of ore at the furnace is sufficient to carry through the interruption to mining operations.

The spring meeting of the American Society of Mechanical Engineers is to be held in St. Paul and Minneapolis, June 16 to 19. The technical excursions, it is expected, will include a trip to Duluth and one to the Mississippi River water power plant at Keokuk. One session is to be devoted to grain handling and ore handling and papers may also be presented on powdered fuel and on the Diesel engine.

The Iron and Metal Markets

LIGHTER PRODUCTS LEAD

Orders Still in Excess of Shipments

Further Buying of Basic Pig Iron—Plates Weak in the West

The signs of betterment in iron and steel markets are now read with little difficulty, and the larger steel manufacturers see the basis of a fair operation of their plants for from two to four months. Any misgiving as to the maintenance of the buying volume of recent weeks grows out of the stringent limiting of railroad purchases and the indications that the metal-working industries are still far from a healthy rate of operations. Most of the latter, having come to the steel mills to renew exhausted stocks, will not need to repeat these orders for some time.

The Steel Corporation's statement of unfilled orders as of January 31 more than met expectations in showing a gain of 331,000 tons in the month, after a year of losses. The January bookings were about 40,000 tons a day and the shipments about 28,000 tons, or something less than a two-thirds operation. For the first week of February the new orders averaged 50,000 tons a day.

Thus far the business in the lighter forms of steel has exceeded that for the heavier products and there must be much greater buying of rails, plates and structural shapes to insure sustained operations at any close approach to capacity.

Pig iron producers find encouragement in the demand for basic iron in the Central West that has carried the price $1 a ton above low point. In the past week sales of about 25,000 tons have been made at $13.25 Valley furnace, following a total of 50,000 tons at lower prices in the week preceding. In southern Ohio 40,000 tons of basic was sold and in eastern Pennsylvania sales and inquiries total 25,000 tons, the sales being at $14 delivered.

Foundry iron has been inactive in the East, but the quiet buying in the Central West and the Chicago district has kept up, though at less than the January rate. A large malleable interest has closed for 20,000 tons at Chicago. While $13.75 at furnace for local No. 2 foundry iron has been done lately, the general market there is now more nearly $14. In the Cleveland district, after a period of marked weakness, pig iron prices are up from 25 to 50 cents. Southern iron, with considerable accumulations of stock in Alabama in January, has sold at $10.75, Birmingham, and in some cases at $10.50 for No. 2. St. Louis sales of foundry and basic in the past two weeks are put at 60,000 tons.

The call for semi-finished steel, represented by specifications going to Pittsburgh and Youngstown mills, shows that independent sheet mills and tin plate plants are quite active. Sheet bars have stiffened and are now close to $23 at mill.

Not all steel companies have had larger bookings in the past week than the January average, though this has been true generally in the Pittsburgh district.

Structural work is increasing and on recent lettings the average of bids is higher than in January. In Eastern districts 5000 tons of bridge work is a noteworthy item. For the third tracking of Fulton street elevated in Brooklyn 12,000 tons has just been let and bids have gone in on 27,500 tons more of New York Subway work.

New car orders include 1000 for the Buffalo, Rochester & Pittsburgh besides 1200 in scattered orders, and 7000 tons of steel was bought for car center construction for the Chicago & Northwestern. What are called active inquiries are out for 10,000 cars.

Plates are the weakest spot in the finished steel market and in the Chicago district, where the mills are most in need of orders, it is still possible to buy at 1.15c., Pittsburgh. For the two government colliers, on which the Maryland Steel Company is low bidder, the plates, shapes and other steel will amount to about 25,000 tons.

The Connellsville coke market has been stiffened by the improvement in pig iron and two sellers are now asking $2.15 for the second half.

In cast iron pipe, while there has been good buying for some weeks, it has not lifted prices. At Boston 3700 tons went at $20.79, with other bids at $21.50, $21.90 and $22.70. Newark is taking bids on 4500 tons and Worcester, Mass., on 3200 tons. The report that 45,000 tons of pipe for Italy will be furnished by a Delaware River maker cannot be confirmed.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Feb. 11, 1914.	Feb. 4, 1914.	Jan. 14, 1914.	Feb. 12, 1913.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	**$15.00**	$14.75	$14.50	$18.25
No. 2, Valley furnace....	**13.25**	13.00	12.75	17.00
No. 2 Southern, Cin'ti..	13.75	13.75	14.00	16.75
No. 2, Birmingham, Ala.	10.50	10.50	10.75	13.50
No. 2, furnace, Chicago*	*13.75*	14.00	14.00	17.25
Basic, del'd, eastern Pa.	14.00	14.00	14.00	18.00
Basic, Valley furnace...	**13.25**	13.00	12.50	16.35
Bessemer, Pittsburgh ...	**15.15**	14.90	14.90	18.15
Malleable Bess, Ch'go*..	*13.75*	14.00	14.00	17.25
Gray forge, Pittsburgh..	13.65	13.65	13.65	17.15
L. S. charcoal, Chicago..	15.25	15.25	15.25	18.00
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh.	21.00	21.00	20.00	28.50
O.-h. billets, Pittsburgh..	21.00	21.00	20.00	29.00
O.-h. sheet bars, P'gh....	22.00	22.00	20.00	29.50
Forging billets, P'gh....	25.00	25.00	24.00	36.00
O.-h. billets, Phila.....	22.40	22.40	21.50	32.00
Wire rods, Pittsburgh...	**26.50**	26.00	25.50	30.00
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	13.00	13.00	13.00	16.25
Iron rails, Philadelphia..	16.50	16.50	15.50	18.00
Carwheels, Chicago	**12.75**	12.25	11.50	16.75
Carwheels, Philadelphia.	12.50	12.50	12.00	15.50
Heavy steel scrap, P'gh.	**12.75**	12.25	11.00	14.25
Heavy steel scrap, Phila.	11.00	11.00	10.00	13.00
Heavy steel scrap, Ch'go.	**11.00**	10.25	9.25	12.25
No. 1 cast, Pittsburgh..	**12.00**	11.25	10.75	15.00
No. 1 cast, Philadelphia.	**13.00**	12.50	12.00	14.50
No. 1 cast, Ch'go (net ton)	**11.25**	10.75	10.25	12.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	**1.25**	1.22½	1.20	1.67½
Iron bars, Pittsburgh...	**1.40**	1.35	1.35	1.70
Iron bars, Chicago.....	**1.12½**	1.10	1.12½	1.60
Steel bars, Pittsburgh...	1.20	1.20	1.20	1.70
Steel bars, New York...	1.36	1.36	1.36	1.86
Tank plates, Pittsburgh.	1.20	1.20	1.20	1.70
Tank plates, New York.	1.36	1.36	1.36	1.86
Beams, etc., Pittsburgh.	1.20	1.20	1.20	1.70
Beams, etc., New York..	1.36	1.36	1.36	1.86
Skelp, grooved steel, P'gh	**1.25**	1.20	1.20	1.45
Skelp, sheared steel, P'gh	**1.35**	1.30	1.30	1.50
Steel hoops, Pittsburgh..	1.30	1.30	1.35	1.60

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	1.95	1.95	1.85	2.35
Galv. sheets, No. 28, P'gh	2.95	2.95	2.85	3.50
Wire nails, Pittsburgh..	1.60	1.60	1.55	1.75
Cut nails, f.o.b. East'n mills	1.65	1.65	1.65	1.80
Cut nails, Pittsburgh...	1.60	1.60	1.55	1.70
Fence wire, base, P'gh..	1.40	1.40	1.35	1.55
Barb wire, galv., P'gh..	2.00	2.00	1.95	2.15

Coke, Connellsville,
Per Net Ton at Oven:

	Feb. 11, 1914.	Feb. 4, 1914.	Jan. 14, 1914.	Feb. 12, 1913.
Furnace coke, prompt	$1.85	$1.85	$1.85	$2.50
Furnace coke, future	2.00	2.00	2.00	2.50
Foundry coke, prompt	2.50	2.50	2.50	3.50
Foundry coke, future	**2.75**	2.60	2.60	3.50

Metals.

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	15.00	15.00	14.50	16.00
Electrolytic copper, N. Y.	*14.70*	14.75	14.00	15.75
Spelter, St. Louis	**5.30**	5.25	5.10	6.35
Spelter, New York	**5.45**	5.40	5.25	6.50
Lead, St. Louis	4.05	4.05	3.97½	4.20
Lead, New York	4.15	4.15	4.10	4.35
Tin, New York	**41.00**	40.87½	36.70	49.30
Antimony, Hallett's, N.Y.	7.00	7.00	7.00	9.00
Tin plate, 100-lb. box, P'gh	$3.30	$3.25	$3.40	$3.60

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c. New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.20c. to 1.25c. base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including straight taper plates) 3 ft and over	.10
Complete circles 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1¼ in. thick and over, and zees, 3 in. and over, 1.20c. to 1.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, hand rail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Rods.—Bessemer, open-hearth and chain rods, $26.50 to $27.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers annealed, $1.40; galvanized, $1.80. Galvanized barb wire and fence staples, to jobbers, $2; painted, $1.60. Wire nails to jobbers, $1.60. Prices of the foregoing wire products to dealers, in carload lots are 5c. higher. Woven wire fencing, 74 per cent. off list for carloads; 73 off for 1000-rod lots; 72 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.60	$1.65	$1.70	$1.75	$1.85	$1.95	$2.05	$2.15
Galvanized	2.05	2.05	2.10	2.15	2.25	2.35	2.75	2.85

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from February 2, 1914, and iron pipe from June 2, 1913, all full weight:

Butt Weld

Steel. Inches.	Black.	Galv.	Iron. Inches.	Black.	Galv.
⅛, ¼ and ⅜	72½	52	⅛ and ¼	66	47
½	76½	66	⅜	65	46
¾ to 3	79½	71	½	69	56
			¾ to 2½	72	61

Lap Weld

2	76½	68	1¼	56	45
2½ to 6	78½	70	1½	67	56
7 to 12	75½	65	2	68	58
13 to 15	52½	..	2½ to 4	70	61
			4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted

1 to 3, butt	77½	69	1 to 1½, butt	70	59
2, lap	74½	66	2, butt	70	59
2½ to 6, lap	76½	68	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap	68	59

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	67½	57	⅜	63	52
½	72½	66	½	67	60
¾ to 1½	76½	70	¾ to 1½	71	62
2 to 3	77½	71	2 and 2½	72	63

Lap Weld, extra strong, plain ends

2	73½	65	1½	65	59
2½ to 4	75½	67	2	66	58
4½ to 6	74½	66	2½ to 4	70	61
7 to 8	67½	57	4½ to 6	69	60
9 to 12	62½	52	7 and 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends

½	62½	56	½	57	49
¾ to 1½	65½	59	¾ to 1½	60	52
2 to 2½	67½	61	2 and 2½	62	54

Lap Weld, double extra strong, plain ends

2	63½	57	2	55	49
2½ to 4	65½	59	2½ to 4	60	54
4½ to 6	64½	58	4½ to 6	59	53
7 to 8	57½	47	7 to 8	52	42

To the large jobbing trade an additional 5 and 2½ per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from January 2, 1914, are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	61	1½ in.	45
2¼ in.	58	1¾ and 2 in.	49
2½ and 2¾ in.	64	2¼ in.	45
3 and 3¼ in.	69	2½ to 2¾ in.	54
3½ and 4½ in.	71	3 and 3¼ in.	57
5 and 6 in.	64	3½ to 4½ in.	60
7 to 13 in.	61	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.40 to 1.45
Nos. 9 to 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.60
Nos. 13 and 14	1.55 to 1.65
Nos. 15 and 16	1.65 to 1.70

Box Annealed Sheets, Cold Rolled

Nos. 10 and 11	1.60 to 1.65
No. 12	1.60 to 1.65
Nos. 13 and 14	1.65 to 1.70
Nos. 15 and 16	1.70 to 1.75
Nos. 17 to 21	1.75 to 1.80
Nos. 22 and 24	1.80 to 1.85
Nos. 25 and 26	1.85 to 1.90
No. 27	1.90 to 1.95
No. 28	1.95 to 2.00
No. 29	2.00 to 2.05
No. 30	2.10 to 2.15

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.95 to 2.00
No. 12	2.05 to 2.10
Nos. 13 and 14	2.05 to 2.10
Nos. 15 and 16	2.20 to 2.25
Nos. 17 to 21	2.35 to 2.40
Nos. 22 and 24	2.50 to 2.55
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.10 to 3.15
No. 30	3.25 to 3.30

Pittsburgh

PITTSBURGH, PA., February 11, 1914.

The improvement in the steel trade that has come in the past two or three weeks is maintained. It is a question as to whether the improvement will be permanent unless the railroads come in the market and buy the supplies they so badly need, and at present there is no sign of their doing this. However, all the steel mills report an increase in orders, and say that specifications are heavy. Basic pig iron is firm at a minimum of $13.25, at which figure large sales have been made. Bessemer iron has sold in moderate lots at $14.25, and No. 2 foundry iron is up 50c. a ton or more from the lowest price. Steel billets and sheet bars are strong, Pittsburgh and Youngstown mills asking $22 at mill for Bessemer and open-hearth billets and $23 for sheet bars for second quarter. The billet and rail sales bureau of the Carnegie Steel Company reports actual orders entered and sent to the mills for rolling up to February 9 as showing a good increase over the same period in January. Prices on finished iron and steel are strong. The advance in pig iron has stiffened the coke market, and two sellers are asking $2.15 for furnace coke for second quarter. The scrap market is fairly active, with prices strong. Mill operations are on a larger basis. As a result of the betterment in pig iron, three or four Valley furnaces that blew out late last year are reported as getting ready to start again. On December 4 the Producers Coke Company withdrew its price of $2 on furnace coke, stating in its letter of withdrawal that it will quote on actual inquiries. A deal for about 8000 tons of blast furnace coke per month over the entire year is pending.

Pig Iron.—New inquiry for basic and foundry iron continues heavy, and the recent advances of about 75c. a ton on basic and 25c. to 50c. a ton on foundry are being firmly held. The improvement has been so marked that three or four idle blast furnaces in the two valleys may start up before long. There is a fair amount of inquiry for Bessemer iron and malleable Bessemer. Sales during the week have been fairly heavy, and the trade is looking for higher prices in the near future. We note sales of basic iron involving 5000 tons in one lot, the same quantity in another, one lot of 10,000 tons, one of 3000 tons and one of 1000 tons, all at $13.25, Valley furnace, equal to $14.15 Pittsburgh. A local open-hearth steel interest has contracted with a Valley producer for upward of 20,000 tons of basic iron, deliveries extending over the entire year. We note sales of 1500 tons of Bessemer, equal deliveries in March, April and May, at $14.10, Valley furnace, for a local steel casting plant, also 3000 tons and 1000 tons at $14.25. A Cleveland interest has taken 7500 tons of basic for delivery over three or four months for Canton, Ohio. The Westinghouse Electric & Mfg. Company, which has been inquiring for about 15,000 tons, is expected to close this week. We quote Bessemer iron at $14.25; basic, $13.25; No. 2 foundry, $13.25 to $13.50; gray forge, $12.75 to $13; malleable Bessemer, $13.50 to $13.75 for delivery through first half of this year, all at Valley furnace, the freight rate to the Pittsburgh or Cleveland district being 90c. a ton.

Billets and Sheet Bars.—In two successive days last week the billet and rail sales bureau of the Carnegie Steel Company passed specifications to the mills for rolling for nearly 50,000 tons of rails, billets and sheet bars. All the steel mills report very heavy specifications for sheet bars. Leading Pittsburgh and Youngstown mills are asking $23 for Bessemer or open-hearth sheet bars for second quarter. There is a fairly active demand for forging and axle billets and prices are firm. We quote Bessemer and open-hearth billets at $21 and Bessemer and open-hearth sheet bars at $22, f.o.b. makers' mills, Pittsburgh or Youngstown, for this and next month, and $1 a ton higher for second quarter. We quote forging billets at $25 on desirable specifications, embracing only one size, and up to and not including 10 x 10 in., the regular extras being charged for larger sizes. On small orders, forging billets are held at $26. We quote axle billets at $23 for desirable orders and $24 for small orders.

Muck Bar.—A sale is reported of about 500 tons of local muck bar for this and next month at $28, makers' mill, or about $28.35 delivered. Eastern muck bar, made from part scrap, is offered at $26 to $27, delivered Pittsburgh. We quote best grades of muck bar, made from all pig iron, at $28 to $28.50, Pittsburgh.

Steel Rails.—Nothing is known here of the report that the Pennsylvania Railroad has placed its orders for steel rails for 1914 delivery, and said to aggregate about 140,000 tons. There is some preliminary inquiry for standard section rails from the traction companies. Their orders usually call for rails running from 60 to 80 lb. The new demand for light rails is better, and consumers are now trying to buy as far ahead as possible in the belief that prices may be advanced before long. The Carnegie Steel Company received new orders and specifications last week for over 2100 tons of light rails. We quote splice bars at 1.50c. and standard section rails at 1.25c. Light rails, rolled from billets, are quoted as follows: 25, 30, 35, 40 and 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c., and 8 and 10 lb., 1.40c., all in carload lots, f.o.b. Pittsburgh.

Plates.—Inquiries for cars have been more active, and some orders have been closed. The Buffalo, Rochester & Pittsburgh has placed 500 steel gondolas and 500 box cars with the Standard Steel Car Company, and has also bought 15 heavy freight engines. Active inquiries in the market include 1000 steel hoppers for the Virginian Railroad, 1000 coal cars and 200 to 500 box cars for the Denver & Rio Grande and 4000 cars for the Southern Railway made up of 3200 box cars, 600 coal and 200 miscellaneous. The Pressed Steel Car Company has taken 100 40-ton box cars for the New Jersey, Indiana & Illinois. The material for the 1000 steel gondolas and 1000 steel hoppers placed last week by the Chesapeake & Ohio will require about 25,000 tons of plates and small shapes, which will be furnished by Pittsburgh mills. The Maryland Steel Company is the low bidder on the two Government colliers, and if awarded the contract the plates, shapes and bars, 25,000 to 30,000 tons, will likely come to local mills. The general demand for plates is better, and the market is strong. The Carnegie Steel Company is adhering to its minimum price of 1.25c. for plates, but they can still be had from other makers for prompt shipment at 1.20c. We quote ¼ in. and heavier plates at 1.20c. on desirable orders for prompt shipment, and 1.25c. for delivery over first half.

Structural Material.—Inquiries have been active, and some business has been placed. The American Bridge Company has taken 1200 tons for steel buildings for the Great Lakes Stone & Lime Company to be erected in Michigan; the McClintic-Marshall Construction Company has taken 500 to 600 tons for buildings for the Standard Seamless Tube Company's new plant at Economy, Pa., 500 tons for buildings for the Parrish & Bingham Mfg. Company at Cleveland, 1400 tons for bridge work for the Atlantic Coast Line and about 300 tons for a small shop for the Louisville & Nashville Railroad at Louisville. Bids have gone in on 3500 to 4000 tons for the new telephone building to be erected on Seventh avenue in this city. The Jones & Laughlin Steel Company has taken 250 tons of sheet steel piling for a new bridge at Wilmington, Del. Prices are firm. We quote beams and channels up to 15 in. at 1.25c., f.o.b. Pittsburgh. It is said that 1.30c. has been quoted on small inquiries.

Ferroalloys.—The excitement in the ferromanganese market which prevailed last week has quieted down, but we note an inquiry in the market from the Colorado Fuel & Iron Company for 5000 tons for extended delivery. It will likely buy English ferromanganese to be delivered at New Orleans and thence by rail to Pueblo at a freight rate of $5 a ton. We note a sale of 1150

tons of English 80 per cent. ferromanganese for delivery over last quarter of this year and first five months of 1915 at $38, seaboard. There is still a good deal of inquiry, and it is evident some consumers failed to cover during the flurry in prices last week. We now quote English 80 per cent. ferromanganese at $38, Baltimore, the freight rate to Pittsburgh being $2.16 a ton. The Carnegie Steel Company is not quoting below $42 and has been out of the market as an active seller for several weeks. Prices on ferrosilicon are firm, and we note sales of about 75 tons for March and April delivery at $73, delivered. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; over 600 tons, $71, delivered in the Pittsburgh district. We quote 10 per cent. ferrosilicon at $20; 11 per cent., $21, and 12 per cent., $22, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnaces. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Wire Rods.—While the new demand is quiet, the market is firm. The leading interest holds its price at $27. We quote Bessemer, open-hearth and chain rods at $26.50 to $27, f.o.b. Pittsburgh.

Skelp.—Makers report the market more active than for some time, with prices slightly higher. Two local makers are quoting grooved steel skelp at 1.25c. minimum, and will not shade that figure. We have advanced prices $1 a ton, and now quote: Grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.35c. to 1.40c.; grooved iron skelp, 1.65c. to 1.70c.; sheared iron skelp, 1.70c. to 1.75c., delivered to consumers' mills in the Pittsburgh district.

Iron and Steel Bars.—The market on both iron and steel bars is more active and prices are firmer than for some months. The Carnegie Steel Company is holding steel bars at 1.25c. minimum, but one leading maker will still accept 1.20c. on desirable orders, although only for prompt delivery. Two of the local makers of steel bars report they have more orders on their books and are making heavier shipments than at any time since last June. The new demand for iron bars is also better, and the market is higher by about $1 a ton. Makers also report heavy orders for reinforcing steel bars and the outlook for this trade this year is regarded as bright. We quote steel bars at 1.20c. for prompt shipment and 1.25c. for delivery in second quarter and common iron bars at 1.40c. to 1.45c., all f.o.b. Pittsburgh.

Sheets.—Two leading makers report that orders and specifications last week were the heaviest in any one week since last June. Jobbers and consumers are trying to cover as far ahead as possible, but most sellers are asking advances of $1 to $2 a ton for second quarter over prices they will accept for first quarter. All the sheet mills are running to fuller capacity than for several months, the American Sheet & Tin Plate Company having operated its sheet mills six full days last week, running to over 75 per cent. of capacity. Other makers report they are operating from 75 to 90 per cent. For delivery in first quarter we quote No. 28 Bessemer black sheets at 1.95c. to 2c.; No. 28 galvanized, 2.95c. to 3c.; Nos. 9 and 10 blue annealed sheets, 1.45c.; No. 28 tin mill black plate, H. R. and A., 1.90c. to 1.95c.; Nos. 29 and 30, 1.95c. to 2c. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Tin Plates.—This trade is very active in specifications. All the mills are running to 90 per cent. or more of capacity, and have orders ahead to keep them running full into the summer months. The Pope works of the Phillips Sheet & Tin Plate Company at Steubenville, Ohio, containing 12 hot mills, which has been idle since last fall, will likely start this month. The leading interest is operating this week to 91 per cent. of capacity and other makers from 85 per cent. to 100 per cent. New orders are light, as probably 95 per cent. of the tin plate that will be consumed this year is under contract. For the relatively small amount of new business that is going, we quote 100 lb. cokes from $3.30 to $3.40 and 100 lb. ternes from $3.20 to $3.30 per base box, prices depending largely on the order.

Wire Products.—The new demand for wire and wire nails is only fair, as most consumers covered for 60 days or longer prior to the recent advances. Mills report that specifications against these contracts are coming in freely, and shipments are heavier than at any time since last summer. There is no doubt that the two successive advances in prices have stimulated specifications on contracts very materially. We quote wire nails at $1.60; plain annealed wire, $1.40; galvanized barb wire and fence staples, $2; painted barb wire, $1.60, all per 100 lb. f.o.b. Pittsburgh, with actual freight charge to point of delivery, terms being 30 days net less 2 per cent. off for cash in 10 days. Cut nails are also firmer, and we quote at $1.60 to $1.65, f.o.b. Pittsburgh. Discounts on woven wire fencing have been advanced one-half a point, and we now quote woven wire fencing at 74 per cent. off in carload lots, 73 off on 1000-rod lots and 72 per cent. on less than 1000-rod lots, all f.o.b. Pittsburgh.

Spikes.—Inquiries from the railroads are heavy. It is stated the Louisville & Nashville has recently placed about 19,000 kegs for delivery over this year, the business going to local mills. A leading Western road is reported to have placed 7000 to 8000 kegs in the Chicago district and an Eastern road has placed 5000 kegs with a local maker. More actual orders are being placed for spikes than for some time. We quote standard sizes of railroad spikes in large lots at $1.40 to $1.45 and small railroad and boat spikes at $1.55 to $1.60 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—Mills report the new demand very much better, with more actual orders being placed than at any time since last summer. Jobbers and consumers are willing to contract at present prices for delivery through first half. Prices are firmer. We quote: Iron finished tire, ½ x 1½ in. and larger, 1.35c., base; under ½ x 1½ in., 1.50c.; planished tire, 1.55c.; channel tire, ¾ to ⅞ and 1 in., 1.85c. to 1.95c.; 1⅛ in. and larger, 1.95c.; toe calk, 1.95c. to 2.05c., base; flat sleigh shoe, 1.70c.; concave and convex, 1.75c.; cutter shoe, tapered or bent, 2.25c. to 2.35c.; spring steel, 1.95c. to 2.05c.; machinery steel, smooth finish, 1.80c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Standard Pipe.—The new demand for lap and butt weld steel pipe and for iron pipe is much more active than usual at this season. One leading maker states that its actual orders for tubular goods entered in January and sent to the mills for rolling were the largest in any one month since last May. Other makers of pipe report equally encouraging conditions. The inquiry of the Columbus Gas & Fuel Company for 122 miles of 16-in. and 55 miles of 12-in. is expected to be placed this week with a local mill. It is expected that the makers of iron pipe will issue a new card in the near future showing an advance of at least $1 and possibly $2 a ton. Mills report that discounts on both iron and steel pipe, which are given on a previous page, are being firmly held.

Boiler Tubes.—Makers report a slight improvement in the demand for both locomotive and merchant tubes, but it is still considerably less than is required to give the mills making boiler tubes a full amount of work. It is stated that discounts are being quite firmly held and makers are confident that the demand, in sympathy with other lines of finished materials, will soon show improvement.

Shafting.—Makers report the new demand as decidedly better, and prices are getting stronger. Most consumers have covered through the first half, and specifications are coming in freely, especially from the automobile and implement trades. We quote cold-rolled shafting in carload and larger lots at 63 to 64 per cent. and in small lots from 61 to 62 per cent. off, depending on the order, delivered in base territory.

Hoops and Bands.—The new demand for both hoops and bands is only fair, as most consumers are covered through the first half. Makers report specifications coming in freely. The minimum price of bands is 1.20c.

for prompt shipment, but the Carnegie Steel Company is not quoting below 1.25c. for second quarter. We quote steel bands at 1.20c. to 1.25c., with extras as per the steel bar card, and steel hoops at 1.30c., f.o.b. Pittsburgh.

Old Material.—Reliable reports are that the heavy steel scrap in the lists of the Baltimore & Ohio and Pennsylvania railroads which closed last week was bought by two leading local consumers at prices ranging from $13 to $13.15, the higher price having been paid for most of the tonnage. It is said that local dealers who recently sold selected heavy steel scrap at $12.50, delivered, Pittsburgh, are now offering as high as $13 for it. In the past week borings and turnings have advanced fully $1 a ton and heavy steel scrap is up from 50c. to 75c. Other grades of scrap, such as bundled sheet, compressed side and end sheet scrap and rerolling rails, are also higher. There is still a short interest in scrap in the local market, and dealers are trying hard to cover at the best prices they can. The market shows signs of going still higher. Dealers are quoting about as follows per gross ton for delivery in the Pittsburgh and other districts:

Selected heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$12.75 to $13.00
Compressed side and end sheet scrap	11.00 to 11.25
No. 1 foundry cast	12.00 to 12.25
No. 2 foundry cast	11.00 to 11.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.00 to 9.25
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	14.00 to 14.25
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	7.50 to 7.75
Low phosphorus melting stock	15.50
Iron car axles	24.25 to 24.75
Steel car axles	17.25 to 17.50
Locomotive axles, steel	20.75 to 21.25
Locomotive axles, iron	25.25 to 25.75
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
*Machine shop turnings	9.00 to 9.25
Old carwheels	11.75 to 12.00
*Cast-iron borings	9.00 to 9.25
†Sheet bar crop ends	12.50 to 12.75
Old iron rails	14.25 to 14.50
No. 1 railroad wrought scrap	13.50 to 13.75
Heavy steel axle turnings	9.00 to 9.25
Stove plate	8.00 to 8.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

We note sales of 300 tons of low phosphorus melting scrap at $15 and 400 tons of turnings at $9.25, delivered to buyers' mills in the Pittsburgh district.

Coke.—The recent advance of 75c. to $1 a ton in the price of basic pig iron has stiffened up the coke market, and makers who have been holding standard brands of furnace coke at $2 a ton are firmer in their ideas on this price. Sales of 5000 to 6000 tons of furnace coke were made in the past week at these prices. It is stated that one leading furnace interest that has been buying coke at $1.75 is now willing to pay $1.85 on account of the higher market on basic iron. We quote strictly standard furnace coke for delivery in first half at $2 per net ton at oven, but other grades that are regarded as standard are offered at $1.85 to $1.90. We quote strictly standard 72-hr. foundry coke at $2.50 per net ton at oven to consumers, but some grades not as high in quality can be had at $2.35 to $2.40. The output of coke in the Upper and Lower Connellsville regions last week was 301 055 tons, an increase of about 10,000 tons over the previous week.

Nuts, Bolts and Rivets.—The improvement in demand and the firmer tone in prices on nuts and bolts is reflected in the adoption of new discounts on February 5 by the makers, which shows advances on some grades. The new demand is reported much more active, and some makers are not disposed to sell beyond first quarter and are asking higher prices for delivery in second quarter. Shipments of nuts and bolts by the makers are heavier than at any time since last summer. New inquiries for rivets are better, but there is still room for improvement in actual orders. We quote button-head structural rivets at $1.65 to $1.70 and cone-head boiler rivets at $1.75 to $1.80, in carload lots, an advance of $2 to $3 a ton over these prices being charged for small lots, depending on the order. Terms are 30 days net, less 2 per cent. for cash in 10 days. The new discounts on nuts and bolts effective from February 5 are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of makers' works:

Coach and lag screws	80 an 5% off
Small carriage bolts, cut threads	80 % off
Small carriage bolts, rolled threads	80 and 5% off
Large carriage bolts	75 and 5% off
Small machine bolts, cut threads	80 and 5% off
Small machine bolts, rolled threads	80 and 10% off
Large machine bolts	75 and 10% off
Machine bolts, c.p.c. & t nuts, small	80% off
Machine bolts, c.p.c. & t nuts, large	75 and 5% off
Square h.p. nuts, blanked and tapped	$6.30 off list
Hexagon nuts	7.20 off list
C.p.c. & r sq. nuts, blanked and tapped	$6.00 off list
Hexagon nuts, ⅜ and larger	$7.20 off list
Hexagon nuts, smaller than 9/16	$7.20 off list
C.p. plain square nuts	$7.80 off list
C.p. plain hexagon nuts	$5.50 off list
Semi-fin. hex. nuts, ⅜ and larger	85 and 5% off
Semi-fin. hex. nuts, smaller than 9/16	85, 10 & 10% off
Rivets, 7/16 x 6½, smaller and shorter,	80, 10 & 5% off
Rivets, metallic tinned, bulk	80, 10 and 5% off
Rivets, tin plated, bulk	80, 10 and 5% off
Rivets, metallic tinned, packages	80, 10 and 5% off
Standard cap screws	70, 10 and 10 % off
Standard set screws	75, 10 and 10% off

Chicago

CHICAGO, ILL., February 11, 1914.—(*By Wire.*)

The record of tonnages booked by the blast furnaces and steel mills since January 1 affords ample support for the belief that a substantial improvement has been registered. The contracts placed will absorb mill capacity well through the second quarter. The fact that the railroads still have the bulk of their requirements to place augurs well for the period beyond the first half. Thus far specifications have been placed at a rate corresponding to contract schedules and better. The mills have held low priced contracts within a reasonable period. In these respects conditions are most satisfactory, although the buying of rails and cars would be very welcome. On the other hand, due attention should be given to the fact that fabricators, foundries and manufacturers of finished products in iron and steel are still eagerly seeking orders at the low ebb of prices and are far from being as assured in their outlook for the first half as are the mills. The disposition on the part of consumers to overbuy because of the low prices offered has been more applicable to pig iron than steel. The mills secured in this market last week over 60,000 tons of standard and girder section rails. Orders for 4000 cars were placed and prices are being asked on 2000 additional. Shapes, bars and sheets are very firm. The Indiana Harbor mill broke its record for bar tonnage in January. Sheared plates are the weak items in the list, although there is a wider latitude in the prices of all material for Western delivery than in the East. Quotations range from 1.15c., Pittsburgh, for plates to 1.30c. for second quarter delivery of shapes and bars. Last week added a round tonnage of pig iron to the books of the local furnaces. Sales approximating 20,000 tons are reported in addition to the purchase of the National Malleable Castings Company, whose present requirements are understood to be about 20,000 tons. Both Northern and Southern prices show a slight improvement. The sharp advancing of values for old material is almost spectacular and consumers are being forced to pay the higher prices asked.

Pig Iron.—The furnace programme in this territory for the first half now seems well defined on the basis of tonnage placed during the past six weeks. But, despite this fact, prices have shown very little increase in strength. Within the past few days a somewhat firmer line seems to have been drawn at $14, f.o.b. Chicago furnace, but last week witnessed again the taking of business in competitive territory on the basis of $13.75. There are fewer lots of attractive tonnage now in the market for figures and this fact makes for an appearance of greater firmness in the quotations. Exclusive of the contract of the leading malleable interest, which is understood to have covered 20,000 tons, the sale of about 20,000 tons is reported, largely foundry iron. Sales of Southern iron in this market are still limited by price conditions but in contrast with the Northern situation quotations as low as $10.50 and $10.75 are increasingly scarce notwithstanding the lim-

ited sales. Inquiries for second half delivery are numerous and for substantial tonnages, indicating something of a disposition to speculate on the basis of the present price level. An advance of $1 a ton is being asked, however, for last half and except for some deliveries that run over into the third quarter contracts are generally limited to first half. The opinion prevails that some consumers are overbought for the first half and that later deliveries will be pushed over into the third quarter. Already, the delaying of shipments is being requested. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4	$15.25 to $15.75
Northern coke foundry, No. 1	14.25 to 14.75
Northern coke foundry, No. 2	13.75 to 14.25
Northern coke foundry, No. 3	13.50 to 13.75
Southern coke No. 1 f'dry and 1 soft	15.35 to 15.85
Southern coke, No. 2 f'dry and 2 soft	14.85 to 15.35
Southern coke, No. 3	14.35 to 14.85
Southern coke, No. 4	13.85 to 14.35
Southern gray forge	13.60 to 14.10
Southern mottled	13.10 to 13.60
Malleable Bessemer	13.75 to 14.25
Standard Bessemer	16.50
Basic	13.50 to 14.00
Jackson Co. and Kentucky silvery, 6 per cent.	16.90
Jackson Co. and Kentucky silvery, 8 per cent.	17.90
Jackson Co. and Kentucky silvery, 10 per cent.	18.90

(*By Mail*)

Rails and Track Supplies.—The manner in which the railroads continue to refrain from placing their rail orders has no apparent explanation in business conditions. The past week has shown some improvement, with the placing of 20,000 tons of 9-in. girder rails by the Chicago surface lines with the Lorain Steel Company and the arrangement with the Illinois Steel Company for the rolling of the Chicago & Northwestern rails. Of the Northwestern allotment, 2500 tons for the Chicago, St. Paul, Minneapolis & Omaha will be rolled by the Lackawanna Steel Company. The leading interest will also roll about 6300 tons for the Minneapolis, St. Paul & Sault Ste. Marie. Railroad contracting for spikes and bolts has been about completed and there is at present but little activity in this direction. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; tie plates, $27 to $28 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Structural shapes undoubtedly occupy a decidedly strong position in the present market situation. One local mill finds itself well sold up for the first half and is asking 1.30c., Pittsburgh, for forward shipments, with 1.25c. a minimum for immediate business. There is in the West a wider latitude than appears in Eastern markets, and for desirable tonnage quotations equivalent to 1.20c. are still obtainable. Contracts for building steel brought out only a small aggregate, which included 580 tons for the Thomas Brady Building, San Antonio, Texas, to be fabricated by the Stupp Brothers Bridge & Iron Works; 230 tons for the Western Chemical Company, near Denver, Colo., taken by the Jackson-Richter Iron Works; 233 tons for Morris & Co., Chicago, awarded to the South Halstead Street Iron Works; 170 tons for the Zellerbach-Levison Company, San Francisco, to be fabricated by the Central Iron Works. The Moran Bolt & Nut Company will furnish 128 tons of tie rods for the United Railways Company, St. Louis. The railroad demand for steel for car building is still limited. The Chicago & Northwestern is reported as taking figures on 900 center sills; the Illinois Central is taking figures on 500 refrigerator cars, and the Northern Pacific has ordered 40 cars of similar type from the Western Car & Foundry Company. The Chicago, Milwaukee & St. Paul is buying 12 200-ton electric locomotives. For Chicago delivery on structural shapes from mill we quote, for prompt shipment, 1.38c. to 1.43c.

Local jobbers have advanced quotations on mill orders to the basis of 1.25c. Pittsburgh, for prompt shipment and 1.30c. for full first half, which reflects store activity in this respect. Structural shapes out of stock have been subject to an active demand, though tonnage is naturally somewhat under normal. For Chicago delivery from store we quote for structural shapes, 1.75c.

Plates.—The striking feature of the market is the unusual weakness in sheared plates, the Western mills being in real need of orders for their operation. In consequence, desirable specifications can still find takers on the basis of 1.15c., Pittsburgh. The railroads are placing some cars, including 2000 from the Denver & Rio Grande, 1000 from the Union Tank Line, and 1000 from the Illinois Central, the latter two lots going to the American Car & Foundry Company, but the plate mills' situation is a plain indication that much greater activity is needed to establish plates on a firm basis. For Chicago delivery from mill, prompt shipment, we quote 1.33c. to 1.38c.

Out of stock, we quote for Chicago delivery 1.75c.

Sheets.—Local mills are having no trouble in securing the full advance on all sheet business offered, and the tonnage is sufficiently liberal to create an increasing backlog on the mill books. Mill schedules for rolling are already determined into the second quarter in at least one instance, and the first half business seems definitely assured.

For sheets out of store we quote for Chicago delivery as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.50c. to 3.60c.

Bars.—The report from one of the Western mills that its January rolling of steel bars established a new production record will come as something of a surprise. That liberal specifications have been placed with the mills is also evidenced by the advance in local quotations to a minimum of 1.38c., Chicago, and 1.43c., commonly asked. Bar iron tonnage has been offered more freely also, the inland mill of the Republic Iron & Steel Company having sufficient business booked to provide for full capacity operation for the next five weeks. Of this tonnage a very small portion is for railroad use. Other Western bar mills are not so fortunately situated, but some general improvement is reflected in the better prices prevailing. We quote for mill shipment as follows: Bar iron, 1.12½c. to 1.17½c.; soft steel bars, 1.33c.; hard steel bars, 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 57 per cent. off.

Rivets and Bolts.—Fabricators who have been replenishing their stocks of material are responsible for a somewhat freer movement of rivets, but the ample manufacturing capacity in this district is not easily taxed. Some selling of bolts in the smaller sizes is noted and a diminishing tendency to quote extreme discounts is reported. We quote from mill as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 80-12½; cut thread, 80-5; larger sizes, 75-10; machine bolts up to ⅜ x 4 in., rolled thread, 80-15; cut thread 80-10; larger size, 75-15; coach screws, 80-15-10; hot pressed nuts, square head, $6.20 off per cwt.; hexagon, $7 off per cwt. Structural rivets, ½ to 1¼ in., 1.73c. to 1.78c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Out of store we quote for structural rivets 2.40c. and for boiler rivets 2.60c. Machine bolts up to ⅜ x 4 in. 70-10-10; larger sizes 70-12½; carriage bolts up to ⅜ x 6 in. 75-10; larger sizes 70-12½ off. Hot pressed nuts square head, $5.50 and hexagon, $6.20 off per cwt.

Wire Products.—The wire market, possibly more than any other, offers assurance of soundness in its improvement, as shown by the increased tonnages booked since January 1. Behind this improvement there is an unquestioned retail demand. At the advance to the basis of $1.60, the trade is apparently well satisfied. The increase in the sale of steel posts is noteworthy, even when due allowance is made for the short period in which this product has been marketed. January sales show an increase of 300 per cent. as compared with January, 1913. We quote to jobbers as follows: Plain wire No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78; galvanized, $2.18; polished staples, $1.78; galvanized, $2.13, all Chicago.

Old Material.—Values in the local scrap market are advancing with such rapidity and absence of uniformity that the quotations below are submitted without any great assurance that they will accurately represent the market a few days hence. Trading among the middle men proceeds with increasing fervor, while prices advance at a rate that discounts the most optimistic phases of the business situation. Consumers, while they are not paying the top prices at which dealers are negotiating among themselves, find it necessary to make increasingly attractive offers almost daily in order to secure the materials they desire. The influence of the Pittsburgh market is strongly felt in the West with respect to steel scrap and borings, while foundry scrap is so rapidly advancing that some consumers are looking to pig iron as an advantageous alternative. Railroad offerings of scrap are negligible this week, the only list being one for 850 tons from the Chicago, St. Paul, Minneapolis & Omaha. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old carwheels	12.75 to 13.25
Heavy melting steel scrap	11.00 to 11.50
Frogs, switches and guards, cut apart	11.00 to 11.50
Shoveling steel	10.25 to 10.75
Steel axle turnings	7.25 to 7.75

Per Net Ton

Iron angles and splice bars	$13.25 to $13.75
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.75 to 10.25
Iron car axles	18.50 to 19.00
Steel car axles	13.75 to 14.25
No. 1 railroad wrought	9.75 to 10.25
No. 2 railroad wrought	9.25 to 9.75
Cut forge	9.25 to 9.75
Steel knuckles and couplers	9.75 to 10.25
Steel springs	10.75 to 11.00
Locomotive tires, smooth	10.75 to 11.25
Machine shop turnings	5.75 to 6.00
Cast borings	5.50 to 6.00
No. 1 busheling	8.75 to 9.25
No. 2 busheling	7.00 to 7.50
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	9.75 to 10.25
No. 1 cast scrap	11.25 to 11.75
Stove plate and light cast scrap	10.00 to 10.50
Grate bars	9.75 to 10.25
Railroad malleable	10.75 to 11.25
Agricultural malleable	9.00 to 9.50
Pipes and flues	8.25 to 8.75

Philadelphia

PHILADELPHIA, PA., February 10, 1914.

Orders for both crude and finished materials continue at a very fair rate. In pig iron considerable tonnage has been quietly bought and more interest is shown in steel-making grades. Prices generally are stronger. Statistics of the Eastern Pig Iron Association show orders to have increased about 25 per cent. in January, with stocks on furnace yards practically unchanged. Inquiry for steel billets has increased and makers are holding prices more firmly. The finished material situation is unchanged. Heavy plate mills continue to receive good orders but find the uplifting of prices difficult. Current demand for shapes has been a trifle easier. Iron bars show increasing strength. Mill operations vary from 65 to 80 per cent. Coke is quiet. The old material market shows increasing strength.

Pig Iron.—While there has been a fair movement in foundry iron, important transactions have either been closed or are under way in other grades, basic and mill forge particularly showing more activity A disposition to put through business without publicity is still in evidence, in transactions covering both moderate and large tonnages. General sales of foundry iron have been principally small lots with prices ranging about 25c. higher than the recent minimum. Standard brands of eastern Pennsylvania No. 2 X are now on a minimum basis of $15 delivered, with possibly one exception, where $14.80 can be done for small prompt lots, although the same seller quotes above $15 for forward delivery. Some makers are quoting as high as $15.50, and make small sales on that basis. Cast-iron pipe makers in this district have been buying moderate lots of off grade iron, paying $14 delivered at Delaware River points. Virginia foundry has been moderately active, but most of the sales have been small. Makers of Virginia foundry have now practically withdrawn the usual differential for No. 2 plain iron, quoting $12.75 at furnace for both No. 2 X and No. 2 plain. In instances $13 at furnace is named for second quarter. The most important foundry iron inquiry before the trade in this district is that just out from the Pennsylvania Railroad, for 1850 to 3700 tons of low silicon, 1000 to 2000 tons of No. 2 X and 850 to 1700 tons of charcoal iron, for second quarter. Several inquiries covering moderate quantities of No. 2 X and No. 2 plain are also before the trade. Following recent forge iron inquiries a Schuylkill Valley mill has placed orders for upward of 5000 tons for delivery into second quarter. It is understood that $14 delivered was shaded on this business, which was divided among several producers. Negotiations are pending for round lots of basic iron for second quarter delivery. One central Pennsylvania steel maker expects to close for over 10,000 tons in a few days, while another in the same district is negotiating for a somewhat smaller quantity. Reports are current that an Eastern melter has purchased a block of basic for delivery into the second quarter at $14 delivered, but producers are now holding with comparative firmness at $14.25 for this grade. Moderate sales of standard analysis low phosphorus have been made at $21 delivered here. Pig-iron producers generally take a more optimistic view of the situation. There is a gradual hardening of prices and concessions are hard to get. The following range of prices about represents the market for standard brands, delivered in buyers' yards, in this district over the next three to five months:

Eastern Penna. No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia No. 2 X foundry	15.55 to 16.00
Virginia No. 2 plain	15.55 to 16.00
Gray forge	14.00
Basic	14.00 to 14.25
Standard low phosphorus	21.00 to 21.25

Iron Ore.—Consumers show practically no interest. More definite conditions are being awaited. Importations have been exceedingly light, aggregate arrivals at this port for the past week being confined to 16,020 tons of Cuban ore.

Ferroalloys.—While the excitement attending the price flurry in ferromanganese has largely subsided, there is more or less business still under negotiation. After touching $35, seaboard, 80 per cent. foreign ferromanganese rebounded and heavy sales were made up to $38. Estimates now place total sales in excess of 50,000 tons. Many of the large buyers covered for the year and some for even more extended deliveries. The market is still in a somewhat uncertain stage, although fluctuations have about covered the same range in English, German and domestic brands. Domestic makers are understood to have withdrawn at the low level and turned buyers. Today's market for standard 80 per cent. ferromanganese ranges from $39 to $40 seaboard, the inside price subject to cable acceptance. Moderate sales have been made at $40.

Billets.—Makers are somewhat encouraged by increased inquiries, both for rolling and forging steel. One consumer is reported in the market for upward of 7000 tons of rolling steel for first half delivery, while smaller inquiries have been a shade more numerous. An old inquiry for 1000 tons of small forging billets has reappeared. Specifications have been heavier and mill operations show a slight betterment. Prices are firmer, with makers holding at $22.40 delivered here for basic open-hearth rolling steel, with ordinary specification forging billets holding at $4 to $5 a ton advance over rolling steel.

Plates.—A good volume of miscellaneous business continues to be received by Eastern mills which maintain operations on a good basis. Inquiry has been broader and contracts for moderate tonnages for near future and second quarter are being entered more

freely. While some mills ask 1.40c. here for current business, others still name 1.35c. for near future and 1.40c. for second quarter. Several good inquiries are before the trade, one covering about 1000 tons for car work and another for some 4500 tons of plates for boats. Mills generally take a brighter view of the market, but find it difficult to definitely establish a higher level of prices.

Structural Material.—New business in this district continues light, but the trade is encouraged by fair lettings of fabricated work in nearby territory. Current miscellaneous business was lighter last week, but mill activities were maintained on a fairly even basis. Some little bridge work has come out but confined to small tonnages, few cases exceeding 100 tons. Low prices for fabricated work are still in evidence. Reported advances for plain shapes have not yet been generally established, mills in some cases still being willing to accept business at 1.35c. delivered here, although others quote 1.40c. minimum.

Sheets.—Current orders have been on a better basis, and mill operations remain at full capacity. In view of firmer prices consumers have shown a greater disposition to place contracts, although little extended forward buying has been done. Mill order books, however, are in better shape. Prices are stronger and some mills name 1.60c. here for No. 10 blue annealed sheets, although 1.55c. is still being done.

Bars.—The movement in iron bars shows steady moderate improvement. While orders have not been large, they have been more numerous. In view of higher scrap prices, makers are holding prices more firmly. In a few instances recent quotations of 1.15c. at an Eastern mill are available for ordinary iron bars, but the majority of the mills now quote 1.27½c. to 1.32½c. delivered here. Steel bars have been in fair demand, with prices hardening, at 1.35c. to 1.40c. here. Specifications on steel bars are reported more numerous.

Coke.—Business has been comparatively light. Transactions in furnace coke have been unimportant, with prices practically unchanged. Producers adhere to $2 at oven for forward furnace coke. Small sales are the rule in foundry coke, with prices ranging from $2.50 to $2.85 at oven, according to grade. The following range of prices, per net ton, is named for deliveries in buyers' yards in this district:

Connellsville furnace coke	$3.90 to $4.40
Connellsville foundry coke	4.80 to 5.15
Mountan furnace coke	3.60 to 4.10
Mountain foundry coke	4.50 to 4.85

Old Material.—Consumers and sellers appear to be deadlocked on heavy melting steel. Melters refuse to pay better than $11 delivered, except under special conditions, while dealers are transacting business among themselves on a basis of 25 to 50c. advance, and refuse to sell at less than $12, as better prices can be obtained by diverting steel to other districts. Forge fire and bundled sheets are quotably higher on sales to steel mills. Turnings and borings have been more active. Rolling mill grades generally are in better demand, and slightly higher prices have been realized. Machinery cast is stronger. The following quotations about represent the market for deliveries in buyers' yards in this district, covering eastern Pennsylvania and taking freight rate varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel	$11.00 to $11.50
Old steel rails, rerolling	13.00 to 13.50
Low phosphorus heavy melting steel scrap (nominal)	14.50 to 15.00
Old steel axles	17.00 to 17.50
Old iron axles	23.00 to 24.00
Old iron rails	16.50 to 17.00
Old carwheels	12.50 to 13.00
No. 1 railroad wrought	14.50 to 15.00
Wrought-iron pipe	11.00 to 11.50
No. 1 forge fire	9.50 to 10.00
Bundled sheets	9.50 to 10.00
No. 2 light iron (nominal)	5.00
No. 2 busheling (nominal)	8.50 to 9.00
Wrought turnings	9.00 to 9.50
Cast borings	9.00 to 9.50
Machinery cast	13.00 to 13.50
Grate bars, railroad	9.50 to 10.00
Stove plate	10.00 to 10.50
Railroad malleable	10.00 to 10.50

Cleveland

CLEVELAND, OHIO, February 10, 1914.

Iron Ore.—Shipments from Lake Erie docks in January were larger than expected, amounting to 455,759 tons. In the same month in 1913 dock shipments were 842,952 tons and in 1912 284,599 tons. On February 1 there remained in the docks 8,169,020 tons, or about 200,000 tons less than on the same day in 1913. Improved conditions in the steel industry are expected to result in an increase in dock shipments in February. As a result of a falling off in ore consumption late in 1913 some consumers who bought heavily a year ago will have enough of last year's ore to last them well through the summer, and it is very probable that these will not come into the market for new ore until some time after the time of the regular buying movement. We quote 1913 prices as follows: Old range Bessemer, $4.40; Mesaba Bessemer, $4.15; old range non-Bessemer, $3.50; Mesaba non-Bessemer, $3.40.

Pig Iron.—There has been considerable stiffening of prices both by Cleveland and Valley furnaces. One of the Cleveland furnace companies advanced prices Monday on No. 2 foundry to $13.50, both for local delivery and out of town shipment. Most of the Valley furnaces are now asking $13.25 to $13.50 for No. 2 foundry and some small lot sales are reported at the latter price. Most furnace companies claim to have their order books fairly well filled for the first half. On the inquiry from the Westinghouse Electric & Mfg. Company several quotations were made for the last half delivery at an advance of 25c. for the third quarter and 50c. for the last quarter over current prices. One interest reports the sale of some foundry iron for the third quarter at a 50c. advance. There is a moderate volume of business coming out in foundry grades mostly in small lots. One Cleveland interest reports the sale of about 12,000 tons of iron, including about 4500 tons of basic. Some Southern iron is being sold in small lots at $10.75, Birmingham, which now appears to be the minimum quotation. The foundry melt has commenced to show an improvement. We quote, delivered Cleveland, as follows:

Bessemer	$14.90 to $15.15
Basic	13.50 to 13.75
Northern No. 2 foundry	13.50 to 13.75
Southern No. 2 foundry	15.10 to 15.35
Gray forge	13.00
Jackson County silvery 8 per cent. silicon	17.30 to 17.55

Coke.—The market is quiet and prices generally are unchanged. The best makes of furnace coke are quoted at $1.95 per net ton at oven for prompt shipment and $2 for contract. Other standard brands can be added to $1.85 to $1.90. We quote foundry coke at $2.50 to $2.75.

Finished Iron and Steel.—Following the advance made by the leading interest the independent mills are now generally falling in line and are asking 1.25c. for steel bars, plates and structural material for early delivery. While some sales are reported at the advance, buyers so far seem to be having little trouble in getting the 1.20c. price. Most consumers are now under contract for several months, and specifications are coming out on these contracts in fair volume. New orders, however, are expected to fall off in February as compared with January because of the fact that many round lots sales for early shipment were made early in January at the prices then prevailing. A good demand has sprung up for steel specialties, including wheels, ties and vanadium steel. The American Bridge Company has taken 4500 tons of structural material for completing the addition to the May Company store in Cleveland. The McClintic-Marshall Company, Pittsburgh, has taken the contract for a new plant for the Parish & Bingham Company, Cleveland, requiring 500 tons. The Forest City Steel & Iron Company has taken 200 tons for a building for the Diebolt Brewing Company, Cleveland. Sheets are in moderate demand, but prices are not firm. While some business is being taken at 2c. for No. 28 black and 3c. for No. 28 galvanized for immediate delivery as well as the first half, quotations $2 a ton lower are being made by some of the mills for the first quarter delivery. The demand for iron bars has not improved with other lines. The price is unchanged at 1.20c. Cleveland. Warehouse prices are unchanged, but may be advanced short-

ly. Stock prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts and Rivets.—Makers have made an advance of 5 to 10 per cent. on bolts and nuts. New demand has been heavy and many of the larger consumers and jobbers have placed contracts for the first half. Rivets are quiet and firm at 1.60c. for structural and 1.70c. for boiler rivets, these being minimum prices. Most consumers are now under contract. We quote mill discounts as follows: Common carriage bolts, ⅝ x 6 in. smaller or shorter, rolled thread, 80 and 5 per cent.; cut thread, 80 per cent.; larger or longer, 75 and 5 per cent.; machine bolts with h.p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 80 and 10 per cent.; cut thread, 80 and 5 per cent.; larger or longer, 75 and 10 per cent.; coach and lag screws, 80 and 15 per cent.; square h.p. nuts, blank or tapped, $6.30 off; hexagon h.p. nuts, blank or tapped, $7.20 off; c. p. c. and t. square nuts, blank or tapped, $6 off; hexagon, ⅝ in. and larger, $7.20 off; 9/16-in. and smaller, $7.80 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10 and 5 per cent.; 9/16-in. and smaller, 85, 10, 10 and 5 per cent.

Old Material.—Prices on heavy melting steel have been advanced $1 a ton and quotations on several other grades are from 25c. to $1 a ton higher. The demand has improved materially and a fair tonnage has been sold at advancing prices. Producers and dealers are holding material for further advances so that the amount of scrap now available is claimed to be scarce. Several lots of new busheling were sold during the week at $9.50, but some dealers are now asking as high as $11. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Old steel rails, rerolling	$12.00 to $12.50
Old iron rails	13.50 to 14.00
Steel car axles	17.00 to 18.00
Heaving melting steel	11.00 to 11.50
Old carwheels	11.50 to 12.00
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	9.00 to 9.50
Railroad malleable	11.50 to 11.75
Light bundled sheet scrap	7.00 to 7.50
Bundled tin scrap	11.00 to 11.50

Per Net Ton

Iron car axles	$20.00 to $21.00
Cast borings	6.50 to 7.00
Iron and steed turnings and drillings	6.25 to 6.50
Steel axle turnings	7.00 to 7.50
No. 1 busheling, new	10.00 to 10.50
No. 1 busheling, old	9.50 to 10.00
No. 1 railroad wrought	11.50 to 11.75
No. 1 cast	11.50 to 11.75
Stove plate	9.00 to 9.50

Cincinnati

CINCINNATI, OHIO, February 10, 1914.

Pig Iron.—A sale of a round tonnage of basic iron was made to a nearby rolling mill last week by Northern makers. This practically fills the requirements of mills in this territory for the present year, although all fourth quarter needs are not yet entirely provided for. Foundry iron continues to gain strength, but a quantity of warrant iron offered in the South is understood to have had some effect in retarding an advance in prices. Northern furnaces are still quoting on a basis of $13, Ironton, for first half shipment, and this continues to shut out Southern iron from many points where freight rates are in favor of delivery from the Hanging Rock district. Books have not yet been formally opened for third and fourth quarter business, but a few small contracts have been made for foundry iron at $10.75, Birmingham basis, with deliveries extending into the third quarter. For strictly third quarter shipment a number of offers have been refused at the price named. The strengthening of the scrap iron market has had some effect on pig iron, and melters are beginning to take a more active interest in obtaining a supply of both pig iron and scrap to run them through the latter half of the year. Among sales reported is one of 500 tons of Northern No. 2 foundry to an Indiana melter at $13, Ironton, for second quarter. No purchases have yet been made on the large inquiry for foundry iron issued last week by a prominent pump manufacturer. St. Louis territory furnished one request for prices on 500 tons of malleable for shipment over the next five months. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$14.25 to $14.75
Southern coke, No. 2 f'dry and 2 soft.	13.75 to 14.25
Southern coke, No. 3 foundry	13.25 to 13.75
Southern, No. 4 foundry	12.75 to 13.25
Southern gray forge	12.25 to 12.75
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.20 to 15.70
Southern Ohio coke, No. 2	14.20 to 14.70
Southern Ohio coke, No. 3	13.95 to 14.20
Southern Ohio malleable Bessemer	14.20 to 14.70
Basic, Northern	14.20 to 14.70
Lake Superior charcoal	16.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

Coke.—Prices are holding firm on both furnace and foundry grades, with a slight improvement in the demand for both domestic and foundry coke. While new contracting by consumers to fill nearby requirements is still limited, there are indications that buyers are more willing to cover for a last half supply. The majority of the furnaces in this territory have provided for their future wants, but the foundries have been mainly buying to fill nearby needs. Connellsville standard furnace grades are quoted at $1.90 to $2 per net ton at oven, the lower price for prompt shipment. Wise County and Pocahontas 48-hr. brands average about 10c. a ton higher. Foundry coke in all three producing districts ranges from $2.50 to $2.75.

Finished Material.—Both black and galvanized sheets continue in very good demand, but the mills are still unwilling to book any business except for shipment in the next 30 days. A large number of inquiries are coming in, and as soon as books are opened for second and third quarter requirements there will likely be some heavy contracting. It is generally believed that the mills will not care to consider any future business until after the present month is over, and indications point to further advances. We quote No. 28 black sheets at 2.15c. to 2.20c., f.o.b. cars Cincinnati or Newport, Ky., and galvanized sheets at 3.15c. to 3.20c. The warehouse price on steel bars is unchanged at 1.75c. to 1.80c., and on structural shapes at 1.85c. to 1.90c. There is a slightly better demand for railroad track material.

Old Material.—It has been a long time since the market has shown such a marked improvement in a comparatively short length of time. Within the past five days substantial advances have been chronicled and the amount of scrap iron changing hands runs far ahead of expectations. Most of this demand comes from the rolling mills, although the foundries are also buying more freely. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$7.50 to $8.00
Old iron rails	12.00 to 12.50
Relaying rails, 50 lb. and up	20.50 to 21.00
Rerolling steel rails	11.50 to 12.00
Melting steel rails	10.00 to 10.50
Old car wheels	11.00 to 11.50

Per Net Ton

No. 1 railroad wrought	$9.50 to $10.00
Cast borings	5.75 to 6.50
Steel turnings	5.75 to 6.50
No. 1 cast scrap	10.00 to 10.50
Burnt scrap	6.75 to 7.50
Old iron axles	17.00 to 17.50
Locomotive tires (smooth inside)	10.50 to 11.00
Pipes and flues	6.50 to 7.00
Malleable and steel scrap	7.75 to 8.25
Railroad tank and sheet scrap	5.50 to 6.00

Birmingham

BIRMINGHAM, ALA., February 9, 1914.

Pig Iron.—The usual price for Birmingham iron for Southern consumption is $11, though sales in Northern districts are below that price. A producer whose higher manganese iron is sought for has made some sales at $11.50. Two interests quote $11 and one reports sales at that figure. It is generally conceded that January and early February sales made by the Birmingham district furnaces, including basic, approximated 250,000 tons or more. The basic tonnage disposed of was well above 50,000 tons. Owing to pros-

pective increase in steel mill operations sales of basic have probably attained their maximum. The Woodward Iron Company blew in the new stack at Woodward last week, giving that company four active stacks. It is understood that these furnaces are well sold up for some time to come. The new stack has as large capacity as any in the State. The Republic Iron & Steel Company, which is also reported as having good orders is making efforts to complete repairs on its idle stack as soon as possible. February production will show an increase which, however, will be taken care of by shipments. In January stocks increased considerably. We quote per gross ton, f.o.b. Birmingham district furnaces, for shipment to Southern points as follows:

No. 1 foundry and soft	$11.50 to $11.75
No. 2 foundry and soft	11.00
No. 3 foundry	10.50 to 10.75
No. 4 foundry	10.25 to 10.75
Gray forge	10.00 to 10.25
Basic	10.50 to 11.00
Charcoal	24.00 to 24.50

Cast-Iron Pipe.—The improvement in the cast-iron pipe trade has not yet become pronounced, but operations seem normal again and stocks are not accumulating to any great extent. The leading producer is working on large orders for water and gas pipe for the Middle West. The sanitary pipe shops have not recovered and prices are said to be sagging still. We quote per net ton, f.o.b. pipe shop yards, as follows: 4-in., $22; 6-in. and upwards, $20, with $1 added for gas pipe.

Coke and Coal.—The coke situation is not promising. Several points of consumption have not taken their usual winter supply owing to mild weather and other conditions and the Mexican smelters have been idle on account of the revolution. Mobile, Pensacola, New Orleans and other coke-consuming centers have not used near as much as usual. We quote per net ton, f.o.b. ovens, as follows: Furnace coke, $2.50 to $2.75; foundry coke, $3.50 to $4. Coal has shared the conditions affecting coke and good domestic is still sold at steam coal prices. It is denied that the Pratt Consolidated is about to absorb several smaller concerns, although the report has been persistent.

Old Material.—The market shows gradual betterment in tone without much increase in actual business. The yards are advertising for and taking on stock in anticipation of greater activity at the mills and foundries. Sales are largely in small lots with steel grades predominating. Nominal quotations per gross ton, f.o.b. yards, subject to change in each actual trade, are as follows:

Old iron axles (small)	$15.00 to $15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 machinery cast	10.50 to 11.00
No. 1 steel scrap	10.50 to 11.00
Tram carwheels	10.30 to 11.00
Standard carwheels	12.00 to 12.50
Light cast and stove plates	9.00 to 9.50

St. Louis

ST. LOUIS, MO., February 9, 1914.

Pig Iron.—Sales continue to follow closely on inquiry. A considerable tonnage has been contracted for in the past two weeks, of which reports have been withheld and it is estimated that this, including both basic and foundry, will run not far from 60,000 tons, though both buyers and sellers refuse to discuss the matter. Sales reported for the week include about four of 1000 tons each, some special analysis and the rest standard foundry iron. There were sales of ferromanganese aggregating about 2500 tons. In basic iron pending inquiries for about 10,000 tons were definitely closed, the successful bidder being in the Chicago territory. Inquiries outstanding include a considerable number of small lots together with one for 1000 tons and another for 3000 tons for second and third quarter delivery. Prices are held more firmly and while there is still $10.50 Southern iron to be had, Birmingham basis, a much larger proportion of the furnace representatives are being held to the $11 figure and are advised that their producers are reasonably well filled up for the first half. No. 2 Chicago is quoted here now by some sellers at $14 and No. 2 Northern foundry, Ironton basis, at $13.50.

Coke.—The transactions of the week have all been for small lots. By-product coke is quoted on a parity with Connellsville coke.

Finished Iron and Steel.—Finished products have been in increasing demand and the specifications from consumers have shown quite an active situation. The fabricating shops are taking quite freely to fill in stocks and are reported as figuring on considerable business of a larger character than for some time. Bars are in fair demand, both ordinary and reinforcing. Light rails are being specified in a fairly satisfactory way by the lumber and coal interests, though the latter are somewhat slow because of the open winter up to the present time. In plates very little is done and there are no car inquiries here of any importance.

Old Material.—The scrap market continues strong, with prices firmly held. Foundry grades are improving in demand. Some dealers, however, are inclined to regard the market as over-excited and question whether consumers can afford to pay the dealers' prices. Such dealers regard the quotations as somewhat fictitious, but others believe the existing status is stable. Lists out during the week include the Wabash, 2500 tons; Missouri, Kansas & Texas, 2000 tons; Southern, 5500 tons; Mobile & Ohio, 400 tons, and the Standard Oil Company, 300 tons. This heavy offering may shade the market off some. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton

Old iron rails	$12.00 to $12.25
Old steel rails, re-rolling	11.75 to 12.00
Old steel rails, less than 3 feet	11.00 to 11.25
Relaying rails, standard section, subject to inspection	23.00 to 24.00
Old carwheels	11.25 to 11.75
No. 1 railroad heavy melting steel scrap	10.50 to 11.00
Shoveling steel	9.00 to 9.50
Frogs, switches and guards cut apart	10.50 to 11.00
Bundled sheet scrap	5.50 to 6.00

Per Net Ton

Iron angle bars	$10.50 to $11.00
Steel angle bars	9.00 to 9.50
Iron car axles	17.50 to 18.00
Steel car axles	13.00 to 13.50
Wrought arch bars and transoms	12.50 to 12.75
No. 1 railroad wrought	9.00 to 9.50
No. 2 railroad wrought	8.50 to 9.00
Railroad springs	9.50 to 10.00
Steel couplers and knuckles	9.50 to 10.00
Locomotive tires, 42 in. and over, smooth	10.00 to 10.50
No. 1 dealers' forge	7.75 to 8.25
Mixed borings	3.75 to 4.25
No. 1 busheling	8.00 to 8.25
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
No. 1 cast scrap	10.00 to 10.25
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.25
Pipes and flues	6.00 to 6.50
Railroad sheet and tank scrap	6.00 to 6.50
Railroad grate bars	8.00 to 8.25
Machine shop turnings	5.00 to 5.25

San Francisco

SAN FRANCISCO, CAL., February 4, 1914.

There is an evident accumulation of prospective business promising good tonnage in most lines in the next two or three months. Crop conditions have seldom if ever been as favorable as at present, and merchants and manufacturers are beginning to make some provision for an assured demand, for which the stocks recently carried are wholly inadequate. Merchants, however, look for no unusual acceleration in the near future and are skeptical as to the firmness of prices, feeling that the effects of several important factors are still to be fully realized. Orders so far placed are hardly sufficient to bring stocks up to the normal size. Import business is limited principally to bars, shapes and light rails, with a few billets, and is unlikely to extend into other lines at present. The opening of the Panama Canal will, however, tend to remove the element of speculative risk from the import trade, and may enlarge its field. Little additional business is being placed

in foreign bars or shapes, but importers expect a better opening here as trade revives in the vicinity of American mills.

Bars.—The market for soft steel bars is well supplied with foreign material, and arrivals due shortly will probably meet all requirements for some months. There is accordingly little inducement to place additional orders. The distributive movement, though by no means active, is gaining a little. Resale prices continue low and irregular, and prices for direct sea shipment on large lots remain at about 1.65c. for domestic and 1.55c. for foreign. Reinforcing bars have been quiet, and local open-hearth material has been offered as low as 1.85c., though no large tonnage for forward delivery would be taken at this figure. There are more large inquiries in sight than for some months.

Structural Material.—Recent fabricating contracts have been of little importance, either individually or in the aggregate, and a review of work in the hands of local architects shows very few large jobs in prospect. Among the principal items in view for the year are the University of California hospital and the Sweeney office building at Bush and Montgomery streets, neither of which is likely to be let very soon. The Spreckels building and the Crocker building addition are also uncertain. Some progress is noted, however, in smaller work. It is reported that American shapes can be landed here at about 1.75c., against 1.65c. for European, the latter receiving no attention at these figures. A considerable tonnage, however, is arriving on old orders at various Pacific ports.

Rails.—The number of inquiries has increased materially within the last week, and small buyers are taking more interest than for some time. There have been a few large inquiries for light rails, but foreign competition is being encountered in this line, offers of light rails being reported as low as 1.45c.

Plates.—The only purchases of any consequence so far have been made by large consumers, and in view of the prospective requirements an increasing tonnage is expected during the spring. More interest is shown in shipbuilding material as well as tank plates. The letting of a contract is reported to the Union Iron Works, for the construction of a 9500-ton oil tank steamer for the Standard Oil Company. Jobbing trade with the smaller shops is extremely dull, and merchants are buying only to fill in their stocks, which are badly depleted.

Sheets.—The principal buyers seem to have had ample opportunity to buy before the recent advance in prices, and contracting for the first quarter has been fairly general, though the tonnage is not heavy, and current specifications show little increase. If the new level of prices is maintained, however, a larger movement will probably take place.

Standard Pipe.—The only item of importance is an order for 30 miles of 8-in. pipe placed by the Union Oil Company. The jobbing trade shows little improvement, but merchants' stocks are extremely low and a few of them are increasing their supplies. The oil situation looks somewhat better and preliminary plans are under way for several pipe lines, but definite inquiries are scarce. There is little prospect of any importing business in pipe at present.

Cast-Iron Pipe.—More municipal business is coming out than for some months and several new projects are expected to be up for figures in February.

Pig Iron.—The local situation remains unchanged, foundry consumption being extremely light, while practically all importers are carrying large stocks. While most holders show no great eagerness to unload, it is practically impossible to sell except at bargain prices, and values are too uncertain to warrant quotations at present.

Coke.—No new supplies have come in for the last few weeks and none is expected until April, but both dealers and consumers are more than amply supplied from the fall arrivals. Prices remain fairly steady, spot supplies being held at $13 to $14 per net ton, with German Syndicate coke to arrive being quoted around $11 to $12 per gross ton.

Old Material.—Cast-iron scrap is quiet and hardly as firm as it has been, the demand being curtailed by the dullness of foundry work and the large supply of pig iron. Wrought scrap is moving out steadily at the old prices, with little accumulation. The local rail rerolling mill is closed at present, but supplies are scarce and more rails are wanted. The market for steel melting scrap has not yet settled down to a stable basis. Consumers have recently purchased plate shearings at $6 and structural and rail scrap at $8 to $9 per gross ton in sufficient quantity to cover their requirements, but dealers are still unwilling to reduce their old figure on heavy melting scrap. Other lines are quoted as follows: Cast-iron scrap, per net ton, $17; wrought scrap, per net ton, $13 to $15; rerolling rails, per net ton, $16.

Buffalo

BUFFALO, N. Y., February 9, 1914.

Pig Iron.—In this district the week has shown a growing interest in specialties such as high phosphorus, high silicon and charcoal irons; also quite an increase in requisitions for foundry coke, indicating increased foundry activity. The sales for the week have been about 18,000 tons of all grades, with considerable iron still under consideration for forward delivery. Practically nothing has been done for extended deliveries because producers and consumers' views on prices are so far apart. Furnaces as a rule do not appear desirous of quoting on last half business, but some users ask prices for the entire year and those who insist are quoted advances ranging up to $1 per ton for third quarter and somewhat more for last half. This would be equivalent to about $14 for third quarter and higher for fourth quarter for No. 2 X foundry and malleable. For current and first half delivery $12.75 to $13.50 covers the range for the various grades. The tendency is to greater firmness in prices. We quote as follows, f.o.b. furnace, for prompt and first half delivery:

No. 1 foundry	$13.25 to $13.50
No. 2 X foundry	12.75 to 13.25
No. 2 plain	12.50 to 13.00
No. 3 foundry	12.50 to 12.75
Gray forge	12.25 to 12.50
Malleable	13.00 to 13.25
Basic	13.50 to 13.75
Charcoal	15.50 to 16.50

Old Material.—The market continues strong with a good volume of business in nearly everything on the list, with the exception of wrought scrap, the demand for which is lighter. Sales of selected heavy melting steel continue on the basis of $11 per ton, Buffalo. In some instances dealers, anticipating a further rise, have bought scrap, particularly cast borings, at figures in excess of what mills are now paying. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$10.25 to $11.00
Bundled sheet scrap	6.25 to 6.75
No. 1 busheling scrap	9.25 to 9.75
No. 2 busheling scrap	6.50 to 7.00
Low phosphorus steel scrap	15.50 to 16.25
Iron rails	15.00 to 15.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 railroad and machinery cast scrap	12.00 to 12.50
Steel axles	17.00 to 17.50
Iron axles	22.50 to 23.00
Carwheels	12.00 to 12.50
Railroads malleable	10.50 to 11.00
Locomotive grate bars	9.50 to 10.00
Wrought pipe	8.50 to 9.00
Machine shop turnings	5.50 to 6.00
Heavy steel axle turnings	8.25 to 9.00
Clean cast borings	6.50 to 7.00
Stove plate (net ton)	9.75 to 10.00
Bundled tin scrap	12.00

Finished Iron and Steel.—The market on bars, shapes and plates is now more generally 1.25c., Pittsburgh, for first quarter delivery, several producers having followed the advance announced from Pittsburgh last week. New business at the advanced prices has been comparatively light, but specifications have been of good volume. Tin plate prices are firmer in view of the continued advance in pig tin and the further higher price of sheet bars. An advance of $1 is reported on cement coated nails in the week. The demand for wire products has been heavy. Some producers are reported out of the market entirely, so far

as the sale of rods is concerned. The buying movement in wire products continues at the advanced price and specifications are coming in well for immediate requirements, showing a healthy demand. The Husted Milling Company, Buffalo, has this week let a contract for a new elevator and milling plant on the Buffalo River, requiring between 500 and 600 tons of reinforcing bars, and the Great Lakes Dredging & Dock Company, Buffalo, has received a contract for a reinforced concrete dock on the Buffalo River from Main to Michigan streets for the Lackawanna Railroad Terminal, requiring 250 tons of bars. The Cambria Steel Company took the contract for structural steel, about 1100 tons, for the South Park High School, this city, for which G. Baker Long, Worcester, Mass., has the general contract.

German Reports Less Hopeful

Wrought Pipe Demoralized by Failure to Combine—Lower Steel Prices for Export

BERLIN, January 22, 1914.

Little of an encouraging character is to be reported this week. More active calls for delivery of certain products on order are mentioned, but the price situation is by no means satisfactory, particularly in the export trade. Prices for export have latterly given way 2 to 3 marks (48c. to 71c.) a ton. In the home market, too, further reductions in rivets have been reported; in bidding for public contracts at Strasburg several days ago the convention works underbid their own list price of 140 marks ($33.32) by 3.50 marks (83c.), while a firm of dealers bid as low as 126.90 marks ($30.20). The tube trade, too, has been quite demoralized by the breakdown of the efforts to organize a syndicate, and cuts of as much as 30 marks ($7.14) have already been made by some concerns. The Mannesmann company, however, which is the principal tube manufacturer, has been trying to maintain prices.

The home market for pig iron is very quiet, consumers buying cautiously, while not a few are holding entirely aloof. The foreign market, however, has shown a somewhat better tendency, and orders of considerable volume have been booked. Foreign buyers show a disposition to place contracts to the end of June, or even further. It is said that this is due to the better tendency latterly reported from the English trade.

In semi-finished steel home consumers have been buying but slowly for the current quarter, but foreign buyers are inclined to place contracts running even beyond the half year. Notwithstanding this fact, however, the latest export prices mentioned are lower than previously. Ingots and blooms have fallen from 75 to 74s. ($18.25 to $18.01), billets from 77 to 75s. ($18.74 to $18.25), and slabs from 82.50 to 81.50s. ($20.08 to $19.83).

The trade in beams and other structural shapes continues very bad. December shipments were the lowest known since the Steel Works Union was organized about 10 years ago, having reached only about 44 per cent. of allotments.

Bars have been doing better, both home and foreign markets buying more actively and calling regularly for deliveries, but the works complain that ruling prices of 98 to 100 marks ($23.32 to $23.80) are too low to allow satisfactory profits. For export business the situation is still less favorable, prices ranging between 88 and 90 marks ($20.94 to $21.42), f.o.b. Antwerp. Only works favorably situated, or operating very cheaply, are able to sell at so low a level without losing money. Iron bars are also somewhat more active, and prices are steadier.

In heavy plates a better tendency has been observed. Calls for delivery by shipyards are of satisfactory volume. Austrian works, however, which are now in a bad business position, are making very low bids and capture all orders in the Danubian countries.

In wire rods the home price of 117.50 marks ($27.97) is pretty well maintained, but in foreign business competition is sharp, and the export price is as low as 100 marks ($23.80) at Antwerp. In wire products the home trade is not in a satisfactory position, and there is much irregularity in prices.

Weaker prices are again reported from Belgium. Reviews of the Belgian market, written for the German press by Brussels correspondents, are pitched in a despondent tone. In the northern French district reductions of 5 francs (97c.) for bars and bands have just been reported. The production of ores in the Briey district last year amounted to 15,149,000 tons, which compares with 12,687,000 tons in 1912.

BERLIN, January 29, 1914.

The news from the iron market is again mostly rather unfavorable. A very quiet tone prevails, and prices are again somewhat weaker, especially bars and plates. The Hoesch Steel Works, Dortmund, has reduced prices 2 marks (48c.) to 96 to 98 marks ($22.85 to $23.32). The prices of heavy plates has fallen to 100 marks ($23.80), as compared with 103 marks ($24.51) around the middle of the month. The demand for ship plates this month has been unusually active, the Kontor having booked 30,000 tons in the first three weeks.

The Steel Works Union met today and gave out a rather unfavorable report. It says that after the quiet season of December passed specifications began coming in more briskly, but that the cold weather has interfered with shipments and so has hindered an increase in sales. Supplementary orders are expected for the current quarter, however, as consumers had bought on a very cautious basis. The foreign demand for heavy rails has made a good start; a number of orders from European and transoceanic countries have been taken. Sales of steel products for the second quarter of the year were declared open today at unchanged prices.

The shipments of pig are steadily declining. After having dropped below 78 per cent of allotments in December it is now reported that the trade expects them to fall this month below 75 per cent., or some say even below 70 per cent. The position of furnaces in the Siegerland region not attached to powerful companies of mixed production is so precarious that not a few are expected to go to the wall during the present period of depression. Scrap has latterly been doing somewhat better; the downward drift of prices has been checked, and some of the better grades have even risen a little.

Boston

BOSTON, MASS., February 10, 1914.

Old Material.—The dealers are doing rather an active business, but it is largely in filling old orders. They are not accumulating stocks; in fact, scrap is not coming out in any great amount. Prices have advanced again, until the level is much nearer normal than for some months. However, the change is still more or less a sentimental one. The mills are not yet much in evidence in the market, either by inquiry or in the form of orders. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$8.75 to	$9.00
Low phosphorus steel	13.75 to	14.75
Old steel axles	13.25 to	13.75
Old iron axles	21.25 to	21.75
Mixed shafting	12.75 to	13.00
No. 1 wrought and soft steel	9.00 to	9.25
Skeleton (bundled)	6.00 to	6.50
Wrought-iron pipe	8.25 to	8.50
Cotton ties (bundled)	7.25 to	7.75
No. 2 light	3.75 to	4.25
Wrought turnings	5.50 to	6.00
Cast borings	5.75 to	6.25
Machinery, cast	11.25 to	11.50
Malleable	8.00 to	8.25
Stove plate	7.75 to	8.00
Grate bars	6.25 to	6.50
Cast-iron carwheels	11.00 to	11.25

British Iron Market Improving

Increased Pig-Iron Speculation—Semi-Finished Steel Bought by Leading Consumers

(*By Cable*)

LONDON, ENGLAND, February 11, 1914.

A little more business is being done all round, with increased speculation in pig iron. The belief is rather confident that considerable buying is pending. Some fair quantities of Continental semi-finished steel have been bought by leading consumers and sellers are firm. The United States Steel Corporation has taken a small rail order for Lourenzo Marquez. The tin-plate convention, if arranged, will be on the basis of 15 per cent. reduction of output. The United States has bought some billets for early shipment from Rotterdam. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 13s. 3d. to 13s. 6d. ($3.22 to $3.29), an advance of 1½d. (3c.).

(The following prices are per ton of 2240 lb.):

Cleveland pig-iron warrants (Tuesday), 51s. 9d. ($12.59), against 51s. 4½d. ($12.50) one week ago.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 52s. 3d. ($12.71), against 51s. 9d. ($12.59) one week ago.

Hematite pig iron, f.o.b. Tees, 62s. 6d. ($15.21).

Steel sheet bars (Welsh), delivered at works in Swansea Valley, £4 10s. ($21.89).

Steel bars, export, f.o.b. Clyde, £6 ($29.20), against £5 17s. 6d. ($28.59) one week ago.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £5 17s. 6d. ($28.59).

Steel ship plates, Scotch, delivered local yards, £6 17s. 6d. ($33.46).

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 ($43.80).

Steel rails, export, f.o.b. works port, £6 2s. 6d. ($29.81).

(The following prices are per export ton of 1015 kilos, equivalent to 2237.669 lb.):

German sheet bars, f.o.b. Antwerp, 81s. ($19.70).

German 2-in. billets, f.o.b. Antwerp, 76s. ($18.48).

German basic steel bars, f.o.b. Antwerp, £4 10s. to £4 11s. ($21.89 to $22.14).

German joists, f.o.b. Antwerp, £5 2s. to £5 5s. ($24.82 to $25.55).

New York

NEW YORK, February 11, 1914.

Pig Iron.—The quieting down of the pig iron market is more in evidence. Buffalo furnaces have done some business in the Eastern districts in the past week, but no single interest has made any considerable purchase, though in one case a total of 2000 tons was taken. New Jersey buying has been light. Eastern Pennsylvania furnaces which ship into that territory are fairly supplied with orders and therefore are not disposed to quote as low as in January. The situation in general is that there has been a pretty fair buying movement and the probability is that the market will be quiet for several weeks. Beyond an inquiry by the Pennsylvania Railroad for a round amount and the constant efforts of pipe founders to pick up low-priced lots, there is little foundry iron business before the Eastern makers. Basic has developed some activity, however, Eastern steel companies having bought around $14 delivered. Virginia furnaces have been trying to establish higher prices recently, but the market in that quarter is irregular, January quotations considerably below $13 at furnace for No. 2 X foundry iron being still fresh in buyers' minds. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $14.75 to $15; No. 2 X, $14.50 to $14.75; No. 2 plain, $14 to $14.25. Southern iron is quoted at $15 to $15.25 for No. 1 and $14.75 to $15 for No. 2.

Finished Iron and Steel.—Buyers are marking time so far as new commitments are concerned. This is taken to mean that restocking has been completed and new business must wait until consumption again requires replenishment or greater expansion occurs than has yet developed. Meanwhile specifications on contracts continue to be made steadily and prices are held firmly, being more generally 1.25c. Pittsburgh for bars, plates and shapes, especially for delivery in second quarter, with 1.20c. obtainable for shipments in say 30 days. Prices for fabricated material have also stiffened; there appears to be very little bar iron as low as 1.15c., mill, and the producer which last week raised bolt prices 5 per cent. is asking 5 per cent. additional for future delivery. Among late structural awards may be mentioned 12,000 tons for third tracking the Fulton street elevated, Brooklyn, to Milliken Brothers; 1500 tons for the Atlantic Coast Line to the McClintic-Marshall Company; about 750 tons for the Cumberland Valley Railroad to the Pennsylvania Steel Company; 2700 tons for bridges for the Boston & Albany at Springfield to the Phoenix Iron Company; 400 tons for the Seabreeze Hospital, Rockaway, L. I., to the Eastern Steel Company, and 500 tons for the Security Bank, Lynn, Mass., to the Levering & Garrigues Company. Bids were taken on Monday and Tuesday of this week for 12,170 and 15,210 tons, respectively, for extensions to the New York subway system, and at this writing it would appear that the American Bridge Company will do the fabrication for the former. Railroad car purchases since the last report include 500 gondolas and 500 box cars for the Buffalo, Rochester & Pittsburgh, placed with the Standard Steel Car Company; about 1000 so-called center constructions for the Chicago & Northwestern, awarded to the American Car & Foundry Company; 350 freight and 12 passenger cars for the Cuba Company, awarded to the American Car & Foundry Company, which it appears has taken 1000 cars for the Union Tank Line, or twice as many as given on the first report. The Northern Pacific has closed for 250 ore cars. The Denver & Rio Grande is expected in the market for 1000 gondolas, for 300 to 500 box cars, and for 10 passenger cars; the Southern Pacific for 70 cars, 17 of which are of the interurban passenger type and 30 of which are box cars; the Tampico & Panuco Valley Railroad for 65 miscellanenous freight cars; Pennsylvania Railroad Line West for 200 cabooses, and the Pittsburgh Railways for 225 traction cars. We quote mill shipments of steel bars, plates and structural material for early shipment at 1.20c., Pittsburgh, or 1.36c., New York, but 1.41c., New York, for second quarter; iron bars, 1.30c. to 1.35c., New York. We quote iron and steel bars from store, 1.90c. to 1.95c., and shapes and plates, 1.95c. to 2c.

Ferroalloys.—Since the pronounced activity of the past two weeks in the market for 80 per cent. ferromanganese, inquiries and sales have been few, though some negotiations for fair tonnages are understood to be before the trade. It is reported that sales have been made at both $39 and $40, Baltimore, but the market quotation is $39, seaboard, which can perhaps be shaded. A steady business in 50 per cent. ferrosilicon is reported at $73, Pittsburgh, for carloads; $72 for 100 tons and $71 for 600 tons and over.

Cast-Iron Pipe.—Brockton, Mass., will open bids February 13 on 341 tons; Cortland, N. Y., February 18, on 230 tons; Jamestown, N. Y., February 18, on 200 tons, and the Metropolitan Water & Sewage Board, Boston, Mass., February 23, on a quantity as yet unstated. On Monday of this week the city of Boston opened bids on 3700 tons, on which a Philadelphia interest was low bidder, quoting $20.79 delivered, the next highest bidder naming $21.50, while other bids ran from $21.90 to $22.70. On Tuesday, Newark, N. J., opened bids on 4500 tons; Beverley, Mass., on 316 tons; Lowell, Mass., on 241 tons, and Worcester, Mass., on 3200 tons. Much more business is now being done in cast-iron pipe, a great deal of tonnage having been placed privately in the past week. Carload lots of 6 in. continue to be quoted at $22 to $23 per net ton, tidewater.

Old Material.—As far as can be ascertained, no large sales of steel scrap have been made to Eastern consumers. Brokers are paying higher prices than these consumers offer, and apparently this class of scrap is still being shipped to find a market elsewhere. Rolling mills have been taking some wrought scrap and borings, but turnings are comparatively neglected. Foundries in this vicinity are not active buyers of cast scrap. Quotations are continued as follows, per gross ton, New York:

Old girder and T rails for melting	$9.00 to $9.50
Heavy melting steel scrap	9.00 to 9.50
Relaying rails	21.50 to 22.00
Rerolling rails	11.00 to 11.50
Iron car axles	19.50 to 20.00
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	11.50 to 12.00
Wrought iron track scrap	10.00 to 10.50
No. 1 yard wrought, long	9.50 to 10.00
No. 1 yard wrought, short	8.75 to 9.25
Light iron	4.00 to 4.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	8.75 to 9.25
Carwheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	8.50 to 9.00
Locomotive grate bars	7.50 to 8.00
Malleable cast	8.00 to 8.50

Metal Market

NEW YORK, February 11, 1914.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Feb.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
5	15.00	14.62½	41.00	4.15	4.05	5.45	5.30
6	15.00	14.62½	40.85	4.15	4.05	5.45	5.30
7	15.00	14.62½	40.75	4.15	4.05	5.45	5.30
9	15.00	14.62½	40.25	4.15	4.05	5.45	5.30
10	15.00	14.70	40.90	4.15	4.05	5.45	5.30
11	15.00	14.70	41.00	4.15	4.05	5.45	5.30

Added strength was given to copper by the Copper Producers' statement for January, though buying has been irregular. Tin has been active, mostly in a speculative way, and the price is higher. The demand for lead has become light and the market is soft. Spelter has advanced under a better demand from the sheet mills. Antimony stands unchanged.

New York

Copper.—Activity in copper was fairly good on two or three days, with Europe again the best buyer. The dominant feature of the market was the excellent statement of the Copper Producers' Association for January, issued February 9, and printed elsewhere in this issue. The statement was regarded as favorable, especially by Europe, and yesterday there was good buying on orders from abroad with domestic buyers coming into the market also, though not to the same extent. Electrolytic is quoted to-day at 14.70c. Lake is nominal at 15c. to 15.12½c., although sales of high class brands have been made this month at the latter figure. The London quotations to-day are £65 15s. for spot and £66 5s. for futures. Exports this month total 10,337 tons.

Tin.—Heavy dealing took place late February 4, when sales of spot were made at 41c. to 41.25c., with dealers doing most of the buying. It later developed that between 500 tons and 700 tons was sold. On the following day, Thursday, the market was quieter and on Friday it had become dull with some of the dealers cutting prices in the effort to induce business. On Saturday it was foreseen that a decline was on the way and there was still deeper cutting, it being reported that futures had sold down to 40.50c. Since then the market has been quiet. The situation is one due entirely to manipulation, contending forces trying to send the market up or down as the case might be. The metal is quoted to-day at 41c. The London quotations are £185 5s. for spot and £186 7s. 6d. for futures. Arrivals this month total 730 tons and there is afloat 2505 tons.

Lead.—Demand has eased off after an active business and prices are soft but otherwise unchanged at 4.15c., New York, and 4.05c., St. Louis, for ordinary brands. Independent interests might shade these prices. In view of a declining tendency in London, the present light demand here and further rumors of Government action against the American Smelting & Refining Company, it is not believed that higher prices are nearby.

Spelter.—Under a better demand from the sheet mills, quotations have advanced and 5.45c. to 5.50c., New York, and 5.30c. to 5.35c., St. Louis, are now quoted. Good business has been done.

Antimony.—There are no changes except that Chinese and Hungarian brands are a trifle lower. They are quoted at 6c. to 6.37½c. Cookson's is 7.25c. to 7.37½c., and Hallett's, 7c. to 7.12½c.

Old Metals.—The market is firm. Dealers' selling prices are unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	14.25 to 14.50
Copper, heavy and wire	13.75 to 14.00
Copper, light and bottoms	12.75 to 13.00
Brass, heavy	9.00 to 9.25
Brass, light	7.75 to 8.00
Heavy machine composition	12.25 to 12.50
Clean brass turnings	8.75 to 9.00
Composition turnings	11.50 to 11.75
Lead, heavy	3.90
Lead, tea	3.65
Zinc, scrap	4.10

Chicago

FEBRUARY 10.—Quotations for non-ferrous metals participated generally in an upward movement the past week. The agreeable surprise presented in the report of the copper producers, showing a decrease in stock, resulted in a decided stiffening of the market. Tin, lead and spelter made similar advances. The scrap metals are commanding better prices. We quote as follows: Casting copper, 15c.; Lake copper, 15.25c. to 15.50c.; for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 41.25c.; small lots, 43.25c.; lead, desilverized, 4.10c., and corroding, 4.35c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.35c.; Cookson's antimony, 9.50c.; other grades, 8c.; sheet zinc, $7.25, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 12c.; copper bottoms, 11c.; copper clips, 11.50c.; red brass, 11.25c.; yellow brass, 8.50c.; lead pipe, 3.75c.; zinc, 3.75c.; pewter, No. 1, 25c.; tinfoil, 30c.; block tin pipe, 33c.

St. Louis

FEBRUARY 9.—The metal markets, so far as the Missouri product is concerned, have been strong, with some advance and prices are well held at the close to-day. We quote: Lead, 4.05c. to 4.07½c.; spelter, 5.30c. to 5.35c.; tin, 41.15c. to 41.60c.; Lake copper, 15.35c.; electrolytic copper, 15.22½c. to 15.35c.; Cookson's antimony, 7.60c. In the Joplin ore market the top price for sulphide ores reached $45.50 per ton, which was an advance of 50c. The basis range was from $42.50 down to $40. Calamine brought $20 to $21, with the choicest lots selling as high as $26. Lead ore remained unchanged at $50 on the basis of 80 per cent. galena. On miscellaneous scrap metals we quote as follows: Light brass, 5c.; heavy yellow brass, 7.50c.; heavy red brass and light copper, 9c.; heavy copper and copper wire, 9.50c.; pewter, 22c.; tinfoil, 28c.; lead, 3c.; zinc, 2.75c.; tea lead, 2.75c.

Canada's Two Wire Rod Mills

A Canadian iron and steel company writes this office as follows:

"We have read with some interest the article in your issue of February 5 on "Canada's Imports of Iron and Steel." As your statements are usually accurate, we would call your attention to one error in your correspondent's article—the statement that there is only one wire rod mill in Canada. A second mill has been built by the Steel Company of Canada at Hamilton, Ontario. We understand that it is not running at present, but that is only a temporary condition.

"We might also point out that the comparison between 1909 and 1913 gives rather an exaggerated idea of the increase in our imports. The figures are for 12 months ending March 31, so that the 1909 figures cover chiefly imports in 1908, which was an exceptionally bad year. A fair comparison would have been with the year

ending March, 1908. However, the writer is quite correct in his main point, that we are very largely increasing our imports, and that American makers are getting the chief benefit of this increase."

Iron and Industrial Stocks

NEW YORK, February 11, 1914.

The stock market has shown an inclination toward hesitation, probably due to the fact that securities have had a considerable advance and much of the investment demand has been satisfied. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	12⅝- 13	P'gh Steel, pref.	92½- 93
Allis-Chal., pref.	47 - 48	Pressed Stl., com.	42 - 44⅛
Am. Can, com..	30½- 32¾	Pressed Stl., pref.	112½
Am. Can, pref..	92⅞- 94½	Ry. Spring, com.	31 - 32⅞
Am. Car & Fdy., com.	51 - 53½	Republic, com...	25½- 26⅝
Am. Car & Fdy., pref.	116½	Republic, pref...	88½- 89
Am. Loco., com.	34¼- 36¼	Rumely Co., com.	12½- 15⅝
Am. Loco., pref.	101½-102	Rumely Co., pref.	31½- 36½
Am. St'l Fdries.	35⅝- 36½	Pipe, com.	13½
Bald. Loco., com.	45	Pipe, pref.	49
Bald. Loco., pref.	105¾-106	U. S. Steel, com,	64⅞- 66¾
Beth. Steel, com.	35⅞- 36¾	U. S. Steel, pref.	109⅛-111½
Beth. Steel, pref.	76 - 77	West'gh'se Elec..	70 - 72
Case (J. I.), pref.	92	Am. Ship, com.	40
Colorado Fuel...	32½- 34½	Am. Ship, pref..	90 - 92
Deere & Co., pref.	98¾- 99½	Chic. Pneu. Tool	55½- 58
General Electric.	147 -148	Cambria Steel...	49¾- 50¾
Gt. N. Ore Cert.	36½- 38¾	Lake Sup. Corp.	22½- 23
Int. Harv., com.	109 -110½	Pa. Steel, pref.	65
Int. Harv., Corp.	109	Warwick	10½- 10¾
Lackawanna St'l	38¾- 39	Cruc. Steel, com.	16¼- 16⅝
Nat. En. & St., com.	13¼- 14	Cruc. Steel, pref.	93¾- 94½
		La Belle Iron, com.	43¾

Dividends Declared

The American Radiator Company, regular quarterly, 2 per cent. on the common stock, payable March 31, and the usual extra dividend of 2 per cent. paid at this time; also the regular quarterly, 1¾ per cent. on the preferred stock, payable February 10.

The American Steel Foundries Company, regular quarterly, ½ of 1 per cent., payable March 31.

The Studebaker Corporation, regular quarterly, 1¾ per cent. on the preferred stock, payable March 1.

The Pratt & Whitney Company, regular quarterly 1½ per cent. on the preferred stock, payable February 16.

The Niles-Bement-Pond Company, regular quarterly, 1½ per cent. on the preferred stock, payable February 16.

The Griffin Wheel Company, initial, 6 per cent. on the common stock, payable 3 per cent. March 2 and 3 per cent. September 2.

Deere & Co., regular quarterly, 1¾ per cent. on the preferred stock, payable March 1.

Personal

William H. Hulick, New York City, was elected president and treasurer of the Warren Foundry & Machine Company at the annual meeting of stockholders held at Phillipsburg, N. J., on Monday, February 9. He succeeds the late William Runkle. Mr. Hulick has been a director of the company since 1889, serving as vice-president and assistant treasurer since 1890. A. D. Chidsey, Easton, Pa., was elected vice-president and assistant treasurer. The directors elected are John S. Riegel, Edward J. Fox, A. D. Chidsey, James Ingham, John Moore, S. A. Hackett and William H. Hulick.

A. W. Foote and G. E. Randles, president and vice-president of the Foote-Burt Company, Cleveland, will sail Saturday, February 14, for a several weeks' trip to the West Indies and the Panama Canal.

At the recent annual meeting of the Bridge Builders' Society C. D. Marshall, McClintic-Marshall Company, Pittsburgh, was re-elected president; J. V. W. Reynders, Pennsylvania Steel Company, was elected vice-president, and Harry Fuller, King Bridge Company, Cleveland, Ohio, treasurer. The position of secretary will be filled later.

A. M. Brown, formerly secretary and operating manager of the Zug Iron & Steel Company, Pittsburgh, has resigned, and A. W. Tyler has been appointed manager. The officers of this company are as follows: W. M. Wherry, Jr., New York City, president; George W. English, vice-president, general manager and treasurer, and F. C. Campbell, assistant secretary. The vacant position of secretary will be filled at an early date.

E. G. Grace, president Bethlehem Steel Company, sailed for Europe on the Mauretania this week.

Frederick W. Gordon, London, England, has been elected a director of the Niles-Bement-Pond Company to succeed Frederick B. Niles who retired from the board on account of ill health. Other retiring directors and officers were re-elected at the annual meeting held February 4.

R. M. Ott, formerly chief clerk of the Pittsburgh warehouse of the Carnegie Steel Company, has associated himself with Lau & Hogan, 452 West Federal street, Youngstown, Ohio, in the capacity of general manager. This firm has just moved its offices to its new plant at the address named, retaining the old plant at 113 North avenue for ornamental iron and wire work. The new plant is fitted for heavy structural fabricating work.

Lawrence E. Riddle, formerly superintendent of the Isabella furnaces of the Carnegie Steel Company at Pittsburgh, has been appointed general superintendent of the city blast furnaces, embracing Isabella, Lucy, Neville and Edith stacks, succeeding the late John P. Collins.

John Green, formerly with the Otis Steel Company, Cleveland, Ohio, has been appointed superintendent of the plant of the Darlington Steel Casting Company, Darlington, Pa.

Charles S. Ginrich, advertising manager, Cincinnati Milling Machine Company, Oakley, Cincinnati, Ohio, has gone to New York for a six months' stay as head of the Eastern sales department. His headquarters will be with the Prentiss Tool & Supply Company. A. A. Thayer will handle Mr. Ginrich's work during his absence.

F. A. Scott, secretary-treasurer, Warner & Swasey Company, Cleveland, Ohio, and Charles J. Stilwell, who has been in charge of the New York office of the company, sailed for Europe January 31.

Stuart H. Patterson, associated with the Guaranty Trust Company, New York, has been elected a director of the International Steam Pump Company.

C. A. Tupper, formerly commercial engineer of the Allis-Chalmers Mfg. Company and recently secretary of the Iron Trade Review and the Foundry, has been elected secretary-treasurer of the Mining and Engineering World, Chicago. Mr. Tupper will continue independent engineering and metallurgical work, with office at 1419-22 Monadnock Block.

D. W. Bowman, formerly chief engineer of the Phoenix Iron Company, Philadelphia, has engaged in consulting engineering, and is succeeded by Norman E. McLure as chief engineer of the company.

Steel Corporation Rebate Inquiry

The Interstate Commerce Commission, pursuant to the resolution adopted by the Senate February 2, has issued a formal order for an investigation to ascertain whether the United States Steel Corporation or any of its subsidiaries has been guilty of giving or receiving any unlawful rebates, offsets, or preferences, especially within the last six years. Dates for the hearings have not yet been announced. A copy of the order will be served on all common carriers subject to the act to regulate commerce, and on the following corporations: United States Steel Corporation, Carnegie Steel Company, Illinois Steel Company, Indiana Steel Company, National Tube Company, Shelby Steel Tube Company, American Steel & Wire Company, American Sheet & Tin Plate Company, Sharon Tin Plate Company, American Bridge Company, Union Steel Company, Tennessee Coal, Iron & Railroad Company, H. C. Frick Coke Company, Interstate Transfer Railway Company, and Spirit Lake Transfer Railway Company. It is understood that the charges with respect to rebates, on which this investigation is based, do not relate to the payments by the carriers covered by the commission's recent decision in the industrial railroads case.

Obituary

FRANKLIN PHILLIPS, president Hewes & Phillips Iron Works, Newark, N. J., died suddenly from pneumonia February 9, aged 57 years. He was born in Newark and was a son of the late John M. Phillips, founder of the Hewes & Phillips Iron Works. He was a graduate of the School of Mechanic Arts, Cornell University, class of 1878, and since his graduation has been actively engaged as president and general manager of his company, manufacturing Corliss engines and power equipment. His reputation as mechanical, steam and hydraulic engineer was nation wide, and he was frequently called in consultation by eminent engineers from all sections of the country upon large engineering projects. He was actively interested in all civic movements that had for their object the prosperity and upbuilding of his native city and State. He was a trustee of the Newark Technical School, member of the Board of Trade, ex-president of the Newark Foundrymen's Association, member of the Essex Club, major of the Second New Jersey Infantry, and a member of the American Society of Mechanical Engineers. He leaves a widow and two children.

F. H. KINDL, constructing engineer, Pittsburgh, died in the Mercy Hospital in that city February 4, as the result of an operation, aged 51 years. He was born in Bohemia, Austria, and came to this country when quite young. He graduated from the Case School of Applied Science in Cleveland in 1884, and after a few years of practical work in Chicago went to Pittsburgh in 1888 and was made chief engineer of the Carnegie Steel Company. In this capacity he had supervision of construction of a number of large buildings, including that occupied by the Carnegie Steel Company in Pittsburgh. From 1900 he carried on the business of consulting engineer, particularly on large buildings. He supervised, among others, the plans for the erection of the Frick building in Pittsburgh and the Brotherhood of Locomotive Engineers' building in Cleveland, Ohio. He leaves a widow and three children. He was a member of the German and Union clubs, Pittsburgh; the Engineers' Club, New York; the Technical Society, Pittsburgh, and the Carnegie Veteran Association.

CHARLES F. BINGHAM, formerly of Bingham & Taylor, foundrymen, Buffalo, died at Palm Beach, Florida, February 3. He was born in Buffalo in 1844 and at the age of 21 took his place in the iron and general foundry business owned by his father. The firm was then known as Bingham & Son; later, upon the death of the senior member, it was changed to Bingham & Taylor. Mr. Bingham retired from active business in 1905 and the company was incorporated as the W. P. Taylor Company, with W. Perry Taylor as president.

C. ABNER HENDEE, Milwaukee, Wis., at one time a large scrap-iron merchant, was killed by an automobile February 6. He was 85 years old and became confused on the street during a blizzard. C. Cass Hendee, president C. C. Hendee Company, Milwaukee, manufacturer of wire brushes, is a son.

WILLIAM V. COLTHAR, designer of the Timken roller bearing and of other machinery products, died at Springfield, Ohio, January 19. He was proprietor of the Colthar Machine Company and manager of the Victor Vise Company, of that city.

The Detroit Twist Drill Company, Detroit, Mich., at its annual meeting, elected Muir B. Snow president, treasurer and general manager to succeed the late Neil W. Snow. Lewis H. Jones was elected vice-president and G. W. Craighead, secretary. These officers, with Richard P. Joy, Henry H. Sanger and C. H. Hecker, compose the board of directors.

The Never Slip Safety Clamp Company, 141 Broadway, New York, has been decreed an award of a bronze medal by the jury of award of the First International Exposition of Safety and Sanitation held in the City of New York, under the auspices of the American Museum of Safety, 1913.

New Steel Corporation Work

Reports have been published in the past week that work would proceed at once on the bar mill which the Carnegie Steel Company planned a few years ago to erect at Girard, Ohio. In Canada there have been reports also as to the beginning of construction work at the Ojibway, Ontario, plant of the United States Steel Corporation. These statements have evidently grown out of the setting aside of $15,000,000 from the Steel Corporation's earnings for 1913, for various improvements; however, no definite action has been taken on any projected improvement apart from the decision to spend $200,000 or more on the Joliet plant of the Illinois Steel Company, where the new work includes the rebuilding of a blast furnace.

Steel Corporation Orders Increase

The unfilled orders of the United States Steel Corporation on January 31, as reported on Tuesday, February 10, were 4,613,680 tons, against 4,282,108 tons on December 31, an increase of 331,572 tons. This is the first increase since the report of December 31, 1912, when unfilled business stood at 7,932,164 tons. The decline in the calendar year 1913 was 3,650,056 tons, or 46 per cent. Below is given a statement of unfilled tonnage for each month, from December 31, 1910, and previous to that the amounts at the end of each year:

January 31, 1914	4,613,680	February 29, 1912	5,454,200
December 31, 1913	4,282,108	January 31, 1912	5,379,721
November 30, 1913	4,396,347	December 31, 1911	5,084,761
October 31, 1913	4,513,767	November 30, 1911	4,141,955
September 30, 1913	5,003,785	October 31, 1911	3,694,328
August 31, 1913	5,223,468	September 30, 1911	3,611,317
July 31, 1913	5,399,356	August 31, 1911	3,584,085
June 30, 1913	5,807,317	July 31, 1911	3,695,985
May 31, 1913	6,324,322	June 30, 1911	3,361,058
April 30, 1913	6,978,762	May 31, 1911	3,113,187
March 31, 1913	7,468,956	April 30, 1911	3,218,704
February 28, 1913	7,656,714	March 31, 1911	3,447,301
January 31, 1913	7,827,368	February 28, 1911	3,400,543
December 31, 1912	7,932,164	January 31, 1911	3,110,919
November 30, 1912	7,852,883	December 31, 1910	2,674,757
October 31, 1912	7,594,381	December 31, 1909	5,927,031
September 30, 1912	6,551,507	December 31, 1908	3,603,527
August 31, 1912	6,163,375	December 31, 1907	4,624,552
July 31, 1912	5,957,079	December 31, 1906	3,489,719
June 30, 1912	5,807,346	December 31, 1905	7,605,086
May 31, 1912	5,750,983	December 31, 1904	4,696,203
April 30, 1912	5,664,885	December 31, 1903	3,215,123
March 31, 1912	5,304,841	December 31, 1902	5,347,523

Because of changed plans in connection with their other interests, Harrington, Robinson & Co. discontinued the sale of high-grade tool steels on January 31, and simultaneously the agency for Toledo tool steels. Those who desire Toledo steels will still be able to secure prompt deliveries from the full stocks that will be carried in Boston by the Brown-Wales Company, which became February 1 the exclusive distributers in New England for those steels. W. T. James, who has been the chief Toledo traveling representative for Harrington, Robinson & Co., will continue in like capacity, traveling from the office of the Newman-Andrew Company, 107 West street, New York.

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Hotel Walton, on the evening of February 4. A paper was presented by R. H. McLain, of the power and mining department of the General Electric Company, Schenectady, N. Y., on "Electricity in the Foundry," covering lighting and the application of the electric motor to blowers, tumbling barrels, grinders, molding and sifting machines, together with the use of electric cranes and storage battery trucks. The address was profusely illustrated by lantern slides.

The Ludlow-Saylor Wire Company, St. Louis, has elected Guilford Duncan, president; Frank Low and E. J. Gould, vice-presidents; D. I. Meier, secretary and treasurer, and these officers, with William Duncan, C. L. Dean, Leslie Dana and H. M. Meier, directors.

The Erie Bolt & Nut Company, Erie, Pa., has bought a site on the Lake Shore Railroad on which it will build a new plant in the spring. L. Davis, president of the company, states that all the new equipment has been purchased.

THE STEEL CORPORATION SUIT

Continuance of Presentation of Testimony for the Defense—Officers of Subsidiaries Examined

At the hearing in New York City on Wednesday, February 4, Col. H. P. Bope, vice-president and general sales manager of the Carnegie Steel Company, continued his testimony in the Government's dissolution suit against the United States Steel Corporation. In answer to questions put by Richard V. Lindabury, chief counsel for the defendant, Colonel Bope said that immediately after the corporation was formed he was told by Charles M. Schwab, then president, that its policy was "justice to all—live and let live." Colonel Bope declared that, so far as he knew, this policy had never been departed from.

He corroborated statements made by him in the Carnegie Steel Company's minutes relating to the result of the "open market" of 1909 and the keen competition that followed. He said, according to the minutes, that the lower prices had attracted old customers who had gone to independent companies because the Carnegie Company had held to one price. Competitors, he declared, found the pace set by the Carnegie Company too fast, most of the business then coming to the corporation's mills. This competition campaign, however, he testified, did not prove as satisfactory as he had expected and implied in the minutes. It proved, he admitted, that the pace was not too swift for competitors after all. "They had booked more business than we thought."

As a result of this, Colonel Bope said, he had become convinced that the corporation did not have the power to put its competitors out of business. After he had employed every legitimate means to get all the business in sight, and had boasted to his colleagues that it was all coming the Carnegie Company's way, it proved that the only gain the company actually made was in bars. In this the company increased its percentage over competitors 4 per cent. In shapes it barely held its own, while in plates competitors actually gained in their percentage of business. Regarding the fixing of rail prices, he said:

> In February, 1904, the market was greatly depressed. We were in the business depression which began in May, 1900, and lasted to the fall of 1904. It had been customary to confer with the presidents of the leading railroads with regard to the price of rails, because railroads were the only buyers of rails, and naturally it was designed to obtain their views as to the price they could afford to pay, particularly in the period when the railroads were not very busy, due to business depression; and so this question was brought up for discussion at our board meeting and some of us thought we ought to reduce the price. Others thought we should not. The matter was left in status quo; nothing was done.

Cross-examined by Judge Jacob M. Dickinson, representing the Government, Colonel Bope said it had been his practice to notify all his branch offices and agents of price changes. These in turn, he said, informed their customers. He told of meetings of sales managers held at various times, but denied that prices were ever fixed at these conferences. The purpose of the gatherings, he explained, was to discuss general trade conditions.

TENNESSEE COMPANY'S PRODUCT MUCH IMPROVED

On Thursday Frank A. Burr, general manager of sales of the Tennessee Coal, Iron & Railroad Company, testified regarding the changes brought about by the Steel Corporation. He had served as manager of sales under three managements. During the first two regimes, he said, the Tennessee Company experienced much difficulty because of the constant complaints received from customers. These complaints, he said, made the life of the sales agent very uncomfortable, not to say miserable.

Much of the steel that was shipped was irregular in quality and not suitable for the uses to which it was put by the buyers; the steel frequently would be exceedingly hard when the buyer wanted soft steel. In addition to that it was not well rolled, not true to template.

In answer to the question as to what had been his experience since the Steel Corporation took over the plant, Mr. Burr stated that "the quality of the product began to improve immediately," and complaints became less frequent and then ceased entirely. He added that the cost of producing steel rails became less after the corporation absorbed the Tennessee Company. The production of rails, he said, increased to a large degree following the taking over of the company.

Mr. Burr said that as manager of sales he fixes prices in conference with the president. In making prices, he declared, two factors are considered—general market conditions and mill necessity. Competition, he said, was always active.

Harry F. Lowther, assistant purchasing agent of the Delaware, Lackawanna & Western Railroad, described the methods of making purchases, saying that he always calls for competitive bids before placing an order. He submitted in evidence a table showing the prices quoted at various times. These figures indicated that quotations varied greatly.

AN INDEPENDENT STEEL MAKER GIVES HIS VIEWS

On Friday Severn P. Ker, president of the Sharon Steel Hoop Company since 1910 and formerly a vice-president of the Republic Iron & Steel Company, testified that in marketing steel products a great deal depends upon salesmanship, and gave instances of having taken away customers from Steel Corporation subsidiaries. He declared emphatically that the corporation could not put his company out of business no matter how hard it tried to do so.

Asked about prices, Mr. Ker stated that he never knowingly quoted prices lower than that of his competitors. "I would not hesitate," he said, "to quote a lower price if necessity required it. I have always thought that at an even price I could get the business. I never knowingly sold a man an article at a lower price than he could buy it from others. I would feel that it was poor salesmanship to sell a man a commodity at a lower price than he could get from others and good salesmanship to try to get a little more if possible." He said he had no difficulty in ascertaining the prices quoted by competitors. He said that one way of getting the other man's figures was to quote a price higher than you believe he is getting. He said he would undertake to find out the price of any steel commodity in this country in 48 hours.

Mr. Ker testified that the Sharon Steel Hoop Company was incorporated in 1901, after the formation of the Steel Corporation. The men at the head of it, he said, were not "Wall Street magnates," not "industrial workers," but merely "industrial business men."

He went on to say that the corporation could not carry on a destructive warfare without involving all of its competitors, and in the end it would be just as disastrous to the corporation as to the other companies. The fact that the field for its output was open made it impossible, he said, for the corporation to put its competitors out of business.

IMPORTANT CORPORATION STATISTICS

At the hearing on Tuesday, February 10, Chairman E. H. Gary submitted the following statement:

Classificatin of common and preferred stockholders of United States Steel Corporation—preferred as of August 30, 1911; common as of November 17, 1911:

	Common.	Pref'd.
Holders of 1 share	2,994	7,870
Holders of 2 shares	2,086	5,054
Holders of 3 shares	1,287	3,405
Holders of 4 shares	604	2,298
Holders of 5 shares	2,440	5,415
Holders of 6 to 10 shares	6,989	13,316
Holders of 11 to 25 shares	6,399	11,837
Holders of 26 to 50 shares	4,786	7,648
Holders of 51 to 100 shares	3,478	5,356
Holders of 101 to 500 shares	2,673	3,962
Holders of 501 to 1,000 shares	426	470
Holders of over 1,000 shares	1,068	482
	35,230	65,113
Number of holders of common stock of record on the date of payment of the thirty-seventh dividend on the common stock, March 30, 1913		39,679
Number of holders of preferred stock of record on the date of payment of the forty-seventh dividend on the preferred stock, February 27, 1913		74,626

Note.—In addition to the above, there are approximately 50,000 beneficial owners whose stock is held en bloc by bankers and brokers, chiefly foreign. The exact figures covering these holdings cannot be obtained.

From April 1, 1901, to December 31, 1912, the Steel Corporation made these payments:

To employees in wages	$1,659,944,622
For taxes—To States, counties, municipalities and the United States Government	*66,579,789
For interest on corporation bonds and on bonds and interest bearing debt of the subsidiary companies	*337,109,448
For dividends on Steel Corporation stock	495,196,490
Total profits distributed	$832,305,938

*The amounts included in these totals for the nine months in 1901 are partly estimated.

Testimony was also given by Albert P. Haines, Link-Belt Company, Philadelphia, and Fayette R. Plumb, tool manufacturer, Philadelphia, two customers of the Steel Corporation, who testified to the excellent service and treatment given them during a period of years.

Jeremiah W. Jenks, professor of government in New York University, and George C. Smith, consulting economist of the Alexander Hamilton Institute, were questioned concerning elaborate tables and charts they had prepared which purport to show that the price of steel and steel products decreased after the formation of the Steel Trust. These were put in evidence as a refutation to Dr. Walker's statistical tables submitted by Government counsel as proof of the charge in the complaint that prices increased. Professor Jenks stated that Dr. Walker in the preparation of his figures had used a period exceptionally ill-fitted for the purpose.

The Chicago District in Steel Making

The following, taken from the South Works Review, which circulates among the South Chicago, Ill., employees of the Illinois Steel Company, presents a number of the instances, interesting historically, in which the Chicago district has contributed to the progress of steel making:

The North Works was established in 1857 for rolling iron rails.

The Union Works was established in 1863.

The Milwaukee Works was established in 1868.

The Joliet Works was established as an iron rail mill in 1870 and produced its first steel rails in 1873.

The South Works was established in 1880.

The first steel rails made in America were rolled at North Works, May 24, 1865, from blooms made at the experimental Bessemer plant at Wyandotte, Mich.

The first Bessemer plant in the Chicago district was built at Union Works, and began operations July 26, 1871.

The Bessemer plant at South Works began producing steel in 1882.

The first open-hearth steel ingot cast at South Works was made in February, 1895.

The first steel plates rolled at South Works were made from open-hearth steel ingots in February, 1895.

Larger Copper Consumption in January

The monthly statement for January of the Copper Producers' Association shows the stock of copper on hand February 1 to be 87,296,685 lb. This is a decrease of 4,142,182 lb. from that of the month previous, as contrasted with an increase during December of 43,509,438 lb. The decrease in January was a distinct surprise to the trade, which is reported to have expected an increase in stocks of from 5,000,000 to 15,000,000 lb. The January statement of the association compares as follows with that for December:

	January Pounds	December Pounds
Stock of marketable copper of all kinds on hand at all points in the United States at the first of the month	91,438,867	47,929,429
Production of marketable copper in the United States from all domestic and foreign sources in the month	131,770,274	138,990,421
Deliveries of marketable copper in the month:		
For domestic consumption	47,956,955	21,938,570
For export	87,955,501	73,542,413
Total	135,912,456	95,480,983
Stock of marketable copper of all kinds on hand at all points in the United States at the close of the month	87,296,685	91,438,867

The reduction in the surplus for January was caused by a considerable increase in domestic deliveries, amounting to 47,956,955 lb., an increase of 26,018,385 lb. over those for December, or more than double. This, however, is about 20,000,000 lb. below the normal monthly rate. Another important feature of the report is that the total foreign deliveries, amounting to 87,955,501 lb., were next to the largest of any month since the association instituted its reports. The largest previous recorded exports were 88,104,075 lb. in December, 1910. Production was 7,220,147 lb. less in January than in December, being 131,770,274 lb., while total consumption, which was 135,912,456 lb., showed an increase of 40,431,473 lb.

The Compressed Gas Manufacturers' Association held its first annual meeting January 29 at 25 Madison avenue, New York. An executive board was elected, consisting of 15 members. This board organized and elected the following officers: President, Dr. Hugo Lieber; first vice-president, J. B. Greiner; second vice-president, A. Cressy Morrison; secretary and treasurer, John J. O'Rorke. The outgoing executive board entertained the members of the association at an informal dinner in the evening, which was given at the Manhattan Club, with covers laid for 60.

The Texas Railroad Commission has ordered a rate to be made of 75c. per gross ton on iron ore from Richey's Spur, Cass County, on the Texas & Pacific Railroad, to Rusk, where the blast furnace is located now under lease to the Texas Iron Association. It is stated that cast-iron pipe will be manufactured in connection with the operation of the blast furnace. The order makes the carload minimum 40 tons and provides that the ore must be tendered to the railroad company in train lots of not less than 15 cars.

The Western Scrap Iron & Steel Association met on Tuesday evening, February 10, at Hotel La Salle, Chicago; the Central Scrap Iron Association will hold its next meeting on Tuesday evening, February 17, at Hotel Henry, Pittsburgh. The Eastern dealers and brokers in iron and steel scrap will hold a meeting on Thursday evening, February 19, at the Continental Hotel, Philadelphia, for the purpose of forming the Eastern Scrap Iron Association.

The Standard Machinery Company, Providence, R. I., has completed the removal of its plant into new buildings at Auburn, R. I., five miles from the former location in Providence. The company manufactures presses of all kinds, drop hammers, rolling mills, wire-drawing machinery, rotary swaging machines and various specialties.

The Machinery Markets

That conditions are improving slowly but surely is indicated by all of the machinery markets and there is a consequent feeling of optimism in every section of the country. Considerable betterment will be necessary, however, before activity is normal. In New York business is fair as compared with recent dull times and the trade is also drawing encouragement from railroad requirements which have been made known. New England is recovering slowly and while the demand for machine tools is not great it is appreciable. New inquiries have encouraged the Philadelphia trade, despite irregular buying and a slow tendency in closing. Cleveland has had a fair volume of small lot business, and inquiries for car-building equipment are better, although complaint is heard of low prices, especially for locomotive cranes. In Cincinnati some special lines are doing well and the inquiry for machine tools is larger. Sales are increasing slowly but steadily in Detroit, where some special lines are brisk and railroad buying seems nearer. Manufacturers are buying equipment more freely in Chicago, but most of the sales are for single machines. General evidence of greater activity is making Milwaukee cheerful. The discharge from bankruptcy of the Marion Motor Car Company is regarded as a healthy indication in Indianapolis. Trade is fair in the Central South, but below that of last summer. Demand for local industries in St. Louis is making a fair market and the outlook is for still better business. January transactions in Birmingham are regarded as satisfactory evidence that trade is mending. In Texas there has been no change and cheerfulness continues. In the Pacific Northwest present conditions are fairly good and the future promising. In the San Francisco market there has been little business in heavy equipment, but miscellaneous machinery is moving more actively.

New York

NEW YORK, February 11, 1914.

In the New York territory business is below normal, but fair as compared with the slow times of recent months. Inquiries for machine tools are of a miscellaneous character and the purchases being made are mostly to fill imperative need or where substantial savings can be effected by the installation of new machines. For this reason those sellers who are confined to one line of tools notice the least improvement. Second-hand machinery continues in fair demand. Salesmen find many of the plants outside of the city busy, but executives in most cases are disinclined to add to their equipment. The prospect of more active railroad buying is perhaps the most encouraging feature of the market.

Following the appearance of the Union Pacific list, which, it is now ascertained, specifies some 30 or more tools, a list of about 60 machines has been issued by the Seaboard Air Line Railroad, Norfolk, Va. The majority of these tools are for delivery at Portsmouth, Va., and the remainder are to go to Savannah, Ga. In most cases preference is given to motor-drive, but bids are requested on belt drive also on many of the items. Estimates must be submitted by February 21.

List of Portsmouth Shop Requirements

One size A single punch, 60-in. throat, capacity 2 in. hole through 1⅛ thickness.

One 4-spindle staybolt telltale drilling machine, belt-driven.

Two 20-in. Bardons & Oliver turret lathes for brass, belt-driven.

One 28-in. rigid turret lathe, 6¼ in. hollow spindle, motor-driven.

One 52-in. vertical boring mill, motor or belt-driven, with automatic starter.

Two heavy duty bolt lathes, 16 or 18 in. over ways, 40 in. between centers.

One 2½-in. hollow-spindle 24-in. Jones & Lamson lathe, motor or belt-driven.

One 66-in. horizontal boring and drilling machine, motor-driven, with automatic motor starter.

One 17-in. LeBlond heavy duty engine lathe, 36 in. between centers, motor or belt-driven.

One 16-in. x 72-in. self-contained grinding machine, motor or belt-driven, for piston rod grinding.

One stationary oxy-acetylene outfit, including piping.

One 4-point stationary electric welding outfit.

One Bement 90-in. right and left hand quartering machine with adjustable head, motor-driven.

One size A single shear, 60-in. throat to shear 8 in. x 1⅛ in., motor-driven and fitted with motor-driven hoist.

One 35,000 lb. single frame steam hammer.

One two-feeder spring furnace.

One high speed drill press with 30-in. table, motor or belt driven.

One single cylinder surfacer.

One drill press with 24-in. table, belt-driven.

One pipe threading machine, capacity 2½-in. to 8-in.

One size F single shear 18-in. throat, capacity 12-in. x 2¾-in. flat bar, or 4¼-in. round bar.

One 36 x 36-in. x 12 ft. planer with two heads on cross rail and one side head, motor-driven.

One rod bushing press, 50 ton capacity, motor-driven.

One 36-in. Gisholt vertical boring mill, motor-drive.

One LeBlond 27-in. x 10 ft. heavy duty engine lathe, motor-driven.

One 19-in. x 10 ft. LeBlond heavy duty engine lathe, motor-driven.

One Ryerson tube and pipe cutting-off machine, belt-driven.

One No. 5 single shear with 30-in. throat, motor-driven with automatic motor starter.

One No. 2 horizontal punch 12-in. throat, capacity 1 in. hole through 1-in. thickness, motor-driven.

One 4-in. Ajax forging machine, motor-driven with automatic starter.

Two 500-lb. steam hammers.

One forging and treating furnace for high-speed steel machine tools.

One oil muffle furnace for hardening and annealing tools.

One Niles 3-motor traveling crane, 10-ton capacity.

One twist drill grinder, capacity ¼-in. to 3½-in. drill, motor or belt-driven.

One No. 3 LeBlond heavy duty universal milling machine, motor-driven.

One LeBlond 18-in. x 10-ft. engine lathe, motor or belt-driven.

One American high duty tool room lathe, 18-in. x 10 ft., motor-driven.

Requirements of Savannah Shops

One 18-in. Bardons & Oliver turret brass lathe, motor or belt-driven.

One rod bushing press, 50-ton capacity, motor-driven.

One No. 3 universal milling machine, motor or belt-driven.

One 40-in. heavy duty drill press, motor or belt-driven.

One 3-in. x 36-in. hollow spindle turret lathe, motor or belt-driven.

One 32-in. Cincinnati shaper, motor or belt-driven.

Two 18-in. x 8-ft. engine lathes, motor or belt-driven.

One 17-in. LeBlond bolt lathe, 30 in. between centers, motor or belt-driven.

One Yankee twist drill grinder, motor or belt-driven.

One single punching machine, capacity 1⅛-in. hole through 1-in. plate, motor or belt-driven.

One single shearing machine with 36-in. throat, capacity 1-in. plate, motor or belt-driven.

One 500-lb. steam hammer.

One portable electric tool post grinder.

One set pneumatic plate flanging clamps, 12 ft. between housings.

One No. 3 car ripping saw table.

One column bracket cut-off saw.

One car mortiser and borer.

The last four machines named are to be similar to types made by the J. A. Fay & Egan Company, Cincinnati, Ohio.

The Mohawk Valley Mfg. Corporation, Oneida, N. Y., has been incorporated with a capital stock of $50,000 to do a general foundry and iron manufacturing business.

A. G. & I. J. Snyder and L. Schneider, Oneida, are the incorporators.

The De Laval Cream Separator Company, Poughkeepsie, N. Y., has completed plans for an extensive addition to its plant to cost over $200,000.

The Acme Dress Company, Albany, N. Y., has been incorporated by John Blockhaus, J. O'Connell and Samuel Neufield, of that city, to manufacture textiles and clothing.

The Lautz Brothers Company, soap manufacturers, Hanover street, Buffalo, is enlarging and remodeling its boiler house and power plant.

The Whitwood Corporation, Weedsport, N. Y., has been incorporated with a capital stock of $25,000. It will engage in the manufacture of auto trucks and motor vehicles and C. E. Whitwood, C. S. Caywood, Weedsport, and T. M. Osborne, Auburn, are the incorporators.

The Husted Milling Company, Buffalo, is having plans prepared for a new elevator and feed mill on Buffalo River & Buffalo Creek Terminal Railroad, having completed arrangements for the disposal of its factory on the "Nickelplate Railroad."

The Eastern Milling Corporation, Buffalo, has been incorporated with a capital stock of $100,000 to do a general milling business, etc. Nisbet Grammer, John J. Rammacher and Frank J. Mauer are the directors.

The Chace-Barton Belting Company, Buffalo, 405 Linwood avenue, has been incorporated to manufacture hose, belting, etc., and will equip a factory. Stanley T. Chace, Garrett P. Barton and Alexander J. Weppner are the directors.

The C. F. Ernst & Sons Company, 63-75 Lathrop street, Buffalo, is building additions, 80 x 140 ft., 25 ft. high, and 30 x 82 ft., 20 ft. high, structural steel and concrete, to its iron works and structural steel fabricating shop.

The Wahl Printing & Binding Company, Niagara Falls, N. Y., has been incorporated with a capital stock of $30,000 and will equip a printing plant. J. Wahl, R. H. Winters and A. F. Petschke, Niagara Falls, are the incorporators.

The Likly-Armitage Company, Syracuse, N. Y., has been incorporated with a capital stock of $25,000 to manufacture leather goods. H. and B. L. Likly, Rochester, N. Y., and G. B. Armitage, Syracuse, are the incorporators.

The W. A. Case & Son Mfg. Company, Mississippi and Elk streets, Buffalo, manufacturer of plumbers and steamfitters' supplies, is making a further addition to its factory.

Long's Chocolate Works, Oswego, N. Y., has been incorporated with a capital stock of $250,000 by D. D., J. M. & R. M. Long, Oswego, to manufacture confectionery, etc.

Plans are being made for an addition to be made this spring to the plant of the F. I. A. T. Automobile Mfg. Company, Poughkeepsie, N. Y., at a cost of about $75,000. John Lurie is manager.

The Buffalo Slag Company, 51 Hamburg street, Buffalo, N. Y., has been incorporated. H. N. Suyder is general manager.

The board of water commissioners of Madison, N. Y., have sold $14,500 worth of bonds.

The Deyo-Emery Independent Oil Company, Binghamton, has been incorporated with a capital stock of $25,000 to manufacture petroleum products. L. Emory, Bradford, Pa. R. H. and R. M. Deyo, Binghamton, are the incorporators.

The Cedar Cliff Silk Company, Paterson, N. J., has purchased the factory of the J. & D. D. Miller Company, Binghamton, N. Y., and will at once commence its operation.

The New Process Brick Company, Amenia, N. Y., has been incorporated with a capital stock of $125,000 and will equip a brick works. W. H. Bartlett, Amenia; G. H. Bontecou, Beacon, N. Y., and J. O. Campbell, East Rutherford, N. J., are the incorporators.

Catalogues Wanted

The Gastineau Hardware & Machinery Company, Juneau, Alaska, which recently opened a wholesale and retail hardware and machinery establishment, is desirous of receiving catalogues from manufacturers of iron, steel, hardware and machinery.

New England

BOSTON, MASS., February 10, 1914.

Business is reviving slowly, but, apparently, certainly. Observers are influenced to some extent by current opinion, which is that the upward inclination of the curve will continue until, at a low estimate, conditions should pass the normal before May 1. The banks share this view. The steel industry, as represented by the wire mills, is decidedly on the up grade. Of the idle men, of whom so much newspaper talk has been made, few skilled mechanics are included. Some significance may be placed on the fact that retail business has been very good in this section. To consider the machine tool industry by itself, speaking in terms of actual orders and live inquiries, some improvement has been made—not great, but appreciable and encouraging.

The manufacturing corporations in the metal industry, and those that use metal products, including machinery, in a large way are indicating an accelerating prosperity. The Connecticut industrial stocks continue to be in strong demand, with prices tending upward. The Blake & Johnson Company, Waterbury, Conn., manufacturer of metal specialties and machinery, has increased its capital stock from $120,000 to $200,000. The Standard Electric Fittings Company, Stamford, Conn., has issued new stock.

The Skinner Chuck Company, New Britain, Conn., is receiving bids for the addition to its works, plans for which were made last year, the carrying out of which were then deferred until business conditions were more favorable. The building will be 50 x 154 ft., four stories.

The Coppus Engineering & Equipment Company, Worcester, Mass., has purchased the City Brass Foundry on Commercial street and proposes to move the business to a site at the rear of its works at 172 Union street. New equipment will be installed.

A dispatch from Connecticut states that the Torrington Company, Torrington, has purchased the works of the Corey Company, Upper Bedford, Quebec, and will enlarge the establishment.

The Connecticut Electric Mfg. Company, Bridgeport, Conn., has awarded the contract for its new factory, which will be 50 x 150 ft., three stories.

The Rhode Island Malleable Iron Works, Warwick, R. I., has begun the erection of an addition to its plant.

The Howe Scale Company, Rutland, Vt., is making plans for extensions to its works.

An unverified statement in a Bridgeport, Conn., newspaper states that engineers in the employ of the American Brass Company have been at work staking out a large plot of ground between the Washington Bridge and the railroad bridge on the Stratford bank of the Housatonic River, and work on the erection of factory buildings will be started in the near future.

The Naugatuck Malleable Iron Company, Union City, Conn., will build an addition, a portion of which will be given up to a trimming room and the remainder to toilet and motor rooms.

Philadelphia

PHILADELPHIA, PA., February 9, 1914.

A fair amount of new inquiry lends some encouragement to the situation, but actual buying is irregular. Much of the inquiry has been for small single tools. Prospective customers are not inclined to close contracts quickly for machinery or tools. The good supply available is retarding buying until the last moment. Machine tool builders report little change. The demand for both new and second-hand power equipment, while more favorable, is irregular. Small special machinery sells well. Second-hand machinery has been in rather spotty demand.

H. B. Underwood & Co. are taking bids for the erection of a 60 x 160 ft. two-story addition to their machine shop at 1015-1019 Hamilton street.

Justice Cox, Jr., & Co., Land Title Building, are in the market for fifteen 60,000-lb. capacity flat cars.

John Wyeth & Co., manufacturing chemists, Eleventh street and Washington avenue, are taking esti-

mates for the erection of a two-story brick addition to their plant.

The board of directors of the Eveland Engineering & Mfg. Company, 2324-26-28 Market street, Philadelphia, has authorized an increase in its capital stock from $100,000 to $2,000,000, for the purpose of extending its business of manufacturing machine tools, riveters, etc.

The Suburban Water Company, Oakmont, Pa., has plans and specifications for a filtration plant, to be erected at a cost of about $70,000. R. M. Knowles is the engineer.

Charles E. Collins, engineer, Drexel Building, is preparing plans for a sewage disposal plant, to be constructed for the town of Lansdale, Pa. The approximate cost will be $60,000.

Contractors are figuring on a three-story brick addition, 99 x 119 ft., to the manufacturing building of the A. Mecky Company, Seventeenth street and Allegheny avenue, manufacturers of small vehicles. Stearns & Castor are the engineers.

Revised bids are being taken by Barclay, White & Co., Perry Building, for the factory building, to be erected for the Progressive Knitting Mills, Royersford, Pa.

The Little Giant Mfg. Company has been incorporated under the laws of Delaware, with a capital stock of $30,000, to engage in the manufacture of mechanical devices. The incorporators are W. M. Pyle, G. G. Steigler and W. E. McCarthy, all of Wilmington, Del.

It is stated that the Fairmount Park Light & Power Company, Pennsylvania Building, C. E. Platt, president, contemplates the erection of an electric light and power plant in the near future.

Chicago

CHICAGO, ILL., February 9, 1914.

In company with the extension of business in many lines the past several weeks, there is beginning to be apparent a freer buying of tools by manufacturers generally. A much better number of sales of single tools is noted the past week. Railroad purchases have not yet materialized and the filling of its requirements by the Illinois Central seems to have been indefinitely deferred. The Chicago & Western Indiana has sent out a list of machines for prices, the list comprising about 40 tools to be placed in the new shops at Clearing.

The Excelsior Motor Mfg. & Supply Company, 2200 South Union street, Chicago, has had plans completed for a new factory, 100 x 574 ft., six stories, to cost $450,000.

The Campbell Industrial Company, Chicago, has been incorporated with a capital stock of $100,000, to manufacture and deal in machinery. The incorporators are Armin Hartrath, 112 West Adams street, George W. Fitzgerald and T. L. Stitt.

The Atterberry-Hertel Mfg. Company, Springfield, Ill., has been incorporated with a capital stock of $125,000, to engage in the manufacture of plows, furnaces and iron and steel castings. The organizers include H. T. Hertel, H. E. Atterberry and W. C. Moorhead.

The Rock Island Bridge & Iron Works, Rock Island, Ill., has under way a 100 x 150-ft. extension of its plant, to provide for its expanding business.

The commissioners of Rock Island, Ill., will receive bids until February 26 for new pumps for the city pumping plant. Figures are requested on both reciprocating and turbine types at a cost of about $34,000.

The Maywood Garage & Taxi Company, Maywood, Ill., has been organized with a capital stock of $2500, to assemble, overhaul and repair motor vehicles.

The Whitehead Company, Farmington, Ill., has been organized with a capital stock of $10,000, to manufacture steel ties, frogs and switches, especially for mine equipment. The incorporators are Joseph Whitehead and W. C. and A. W. Steenburg.

The J. B. Smith Mfg. Company, Peoria, Ill., has equipped its plant for the manufacture of galvanized sheets.

Improvements in the waterworks plant at Muscatine, Iowa, include the purchase of a 4,000,000-gal. pumping engine for the main station and equipment for a booster station.

The Morris-Blodgett Drop Forge & Tool Company, Independence, Iowa, is the name under which the plant formerly owned by the Danielson Plow Company will be operated. The new company has an authorized capital stock of $100,000.

Bids for testing machinery will be received by the city chemist, room 83, Court House, St. Paul, Minn., till February 16, to include a 400,000-lb. four-screw combined compression, transverse and tensile testing machine complete with accessories and attachments, a bending machine with capacity for bending steel bars, 1½-in. in diameter, complete with motor, etc.

Charles L. Pillsbury, engineer, Metropolitan Block, St. Paul, will have out at once the specifications for the mechanical equipment of the Elliott Hospital, State University, and St. Paul Public Library; also north and south wings for the School for Blind, Faribault, Minn. C. H. Johnston, architect, St. Paul. Later, mechanical equipment for Grand View Cottage, School for Feeble-minded, Faribault, Minn.

The Baird Harvester Company, Decatur, Ill., has been incorporated with a capital stock of $15,000 by James W. Gullett, H. B. Williams and Louis V. Lanum.

The Elgin Automatic Sewing Machine Company, Elgin, Ill., has changed its name to the Acme Shoe Machinery Company and removed to Streator where it will increase its equipment.

The city of East St. Louis, Ill., will take bids on a large gasoline engine.

The plant of the Quincy Laundry Company, Quincy, Ill., was destroyed by fire, February 6, with a loss of $55,000. It will be re-established.

The Humane Safety Bit Company, Champaign, Ill., has been incorporated with a capital stock of $10,000, to manufacture a patented horse bit.

The Vulcan Engineering Sales Company, Chicago, is in the market for three machine tools for the Hanna Engineering Works, its branch at 2059 Elston avenue. The company intends to purchase one second-hand light pattern Gisholt lathe, one 2 x 24-in. Jones & Lamson lathe, with cone head and friction back gears, and one 24 x 24-in. x 6-ft. Gray planer.

The Steel Hub & Forge Company, Connersville, Ind., has been incorporated with a capital of $40,000 to engage in the manufacture of steel wheel hubs. The company was organized by E. W., S. W. and W. M. Ansted and F. P. Bates.

Milwaukee

MILWAUKEE, WIS., February 9, 1914.

The machinery trade in the Milwaukee district has a distinct atmosphere of cheerfulness. There is evidence of improvement on every hand. The improvement is reflected by the report of the building inspector, who issued 82 permits for $342,858 in new construction in January, 1914, against 75 permits for $266,446 in the corresponding period of 1913. Good inquiries for power equipment are coming in. Tool builders report business picking up, although this line has fared better throughout the depression than others. Reports from metal tradesmen in Wisconsin are cheerful. The financial situation has eased up and no longer retards natural development, as the last half of 1913.

Henry W. Theis, 83 Booth street, Milwaukee, has organized the H. W. Theis Mfg. Company, to manufacture plumbers' specialties. The capital stock is $15,000.

Bids close February 18 for the erection of a $50,000 high school building at Kewaunee, Wis., according to plans by Robt. A. Messmer & Bro., architects, Milwaukee. Provision is made for a manual training department to occupy one-half of the basement floor. Otto H. Buemmer, Kewaunee, is city clerk.

W. G. Maxcy, of the Antigo Water Company, has purchased the Antigo Gas Company, Antigo, Wis., for $21,000, and will make changes to promote efficiency and economy in the operation of the two plants under a single ownership.

The West Bend Aluminum Company, West Bend, Wis., has increased its capital stock from $50,000 to $75,000, and will erect a new kitchen utensil and specialty manufactory in the spring. The building will be 60 x 250 ft., two stories, separate power house.

The new $400,000 state normal school to be erected at Eau Claire, Wis., will contain a complete manual training department. Construction contracts will be awarded about March 1 by the board of normal regents, Madison. Van Ryn & DeGelleke, Milwaukee, are the designers.

A. B. Jensen, D. K. Allen and F. H. Hanke, of Menasha, Wis., have organized the Star Pointer Pump Mfg. Company, with a capital stock of $60,000, and will engage in the manufacture of hand and power pumps for farm and home use.

The order of the Wisconsin Railway Commission to the Neshonic Light & Power Company, of West Salem, Wis., requires the company to file plans and specifications for an entirely new hydroelectric power and light plant by February 18. The company must complete the plant and install the equipment recommended not later than August 18. John H. Roemer is chairman of the commission, Madison, Wis.

The State Board of Control, Madison, closes bids March 4 for the construction of a $50,000 addition to the hospital for criminal insane, state penitentiary, Waurun, Wis. Foeller & Schober, Green Bay, Wis., are the architects.

The United Shoe Machinery Company, Boston, has closed leases for the basement and half the ground floor of 286-294 Third street, Milwaukee, in which it will establish a branch factory, repair shop, etc., March 1.

The Edward Gillen Dredge, Dock & Construction Company, Racine, Wis., has increased its capital stock from $75,000 to $100,000. The additional issue will be used for purchasing new tools, etc.

The Board of Regents, University of Wisconsin, Madison, at its last meeting ordered the business manager to complete plans and call for bids for the erection of a liberal arts building; approved preliminary plans for a physics and medical building, a soils building, a woman's bathhouse, and authorized the university architect to work out preliminary plans for the proposed concrete and steel athletic stadium. The total cost of all the work in prospect is in excess of $1,500,000. H. C. Bumpus, Madison, is business manager.

The Standard Separator Company, 85 Oneida street, Milwaukee, is making preliminary arrangements for the establishment of its own plant this year. The probable location will be in the Burnham street manufacturing district between Milwaukee and West Allis.

Oconomowoc capitalists have become interested in the Erni & Mitchell Laundry Machinery Company, Pewaukee, Wis., and plan to move the operations to Oconomowoc, where a large plant is to be provided. B. G. Edgerton, president of the Bank of Oconomowoc, has been elected president of the company. Felix H. Scherffius is secretary.

Detroit

DETROIT, MICH., February 9, 1914.

The outlook for better business conditions continues to improve and while the increase in actual sales is slow, it is steady. Dealers are feeling considerably encouraged. There has been a fair movement of single tools and small lots the past week and inquiries received evidence a continuance of moderate activity in the demand for single tools. In many lines of special equipment the demand may be said to be brisk. There is a large amount of second-hand machinery on the hands of local dealers, but it is moving quite freely. The demand for power equipment is rather more quiet. Some reports indicate that the foundry business is picking up, the improvement being especially noticed by the steel casting plants. A better volume of construction work is reported and the projects are of a more varied character than has been the rule lately.

Selik Brothers, manufacturing machinists, Detroit, have decided on the erection of a new plant which will be built this spring on a site recently acquired at Twenty-fourth and E streets. The new building will be 100 x 140 ft., two stories. The firm manufactures all kinds of small tools and various automobile specialties and has completely outgrown its present quarters at 254 Meldrum avenue.

The American Car & Foundry Company, Detroit, has awarded the contract for the erection of a new machine shop at its Peninsular plant, this city. Plans are private and details of equipment not available.

The Columbia Brewing Company, Detroit, has begun the construction of a three-story addition to its brewhouse. Mildner & Eisen are the architects.

The Scripps-Booth Cyclecar Company, Detroit, recently organized, has acquired the three-story and basement brick factory at 1020-30 Beaufait avenue, formerly occupied by Knell & Adams, body finishers.

John A. Mercier, Charles H. Bryan and Joseph Larkins, all of Detroit, have purchased a large tract in the western part of the city and will erect a large brick plant. The estimated cost of the plant is $100,000, and it is to be completed by July 1.

The United Fuel & Supply Company, Detroit, a $2,500,000 corporation, has been formed to take over the property and business of the C. H. Little Company and the Malcomson-Houghten Company, manufacturers and distributers of building supplies. The two companies operate a number of mills, shops and coal handling plants and are large buyers of various kinds of equipment.

The Michigan Electrotype & Stereotype Foundry, Detroit, has been incorporated with a capital stock of $15,000. L. H. Rand, W. T. Birdan and J. H. Prouty are the incorporators.

C. A. Lauzon and E. P. Neely, Grand Rapids, Mich., have incorporated the Lauzon Furniture Company with a capital stock of $15,000. The new company will operate a factory for the manufacture of special lines of furniture.

The Michigan Bridge & Iron Company, Lansing, Mich., announces that it will double the capacity of its plant this spring with the intention of enlarging its structural shape department in addition to its present large pipe business. The additions have already been begun. George W. Burhaus, formerly in the banking business, has become associated with the company in an official capacity.

The Lansing Tool & Stamping Company, Lansing, Mich., has been incorporated with $40,000 capital stock, to manufacture small tools and sheet metal stampings.

The Lyons Machine Company, Muskegon, Mich., manufacturer of special machinery and tools, is adding to its line of products by the establishment of a department for the manufacture of marine motors. About 100 additional men will be employed as soon as the necessary machinery is installed.

The United Steel & Wire Company, Battle Creek, Mich., has increased its capital stock from $25,000 to $60,000.

The Kalamazoo Stove Company, Kalamazoo, Mich., is establishing a department for the manufacture of steel kitchen cabinets.

The board of electric light commissioners, Durand, Mich., will purchase within next few months one 125-kw. to 177-kw., three-phase, 60-cycle, 1100/2200-volt generator, direct-connected to four-valve non-releasing Corliss engine. H. F. Rosenkrans is superintendent.

C. L. Miller, city clerk, Kalamazoo, Mich., will open bids, February 16, for engines, condensers, pumps, boilers, etc.

The Signal Motor Truck Company, Detroit, has been incorporated with $60,000 capital stock by A. E. Burch, John Squires and R. M. Wendell. The company has established a plant at 672-674 Commonwealth avenue.

The International Milk Products Company, Bad Axe, Mich., has begun the construction of a two-story addition to its plant, 45 x 90 ft., to be used as a condensary.

The Industrial Foundry Company, St. Johns, Mich., has been incorporated with $5000 capital stock to do a general foundry business.

Cleveland

CLEVELAND, OHIO, February 9, 1914.

The condition of the machine tool market shows little change. During the week dealers did a fair volume of business in single tools and a few small lots, but no lists of any size have come out. Machine tool builders report a little more activity in inquiry for equipment from car builders. The demand for locomotive cranes shows some improvement, but complaint is being made regarding prices. Small power plant equipment for remodeling plants continues in fairly good demand.

The A-1 Metallic Products Company, Cleveland, has been organized with a capital stock of $10,000 by James C. Thatcher, and others. The company will have quarters in the building occupied by the Burke Valve Company on Windsor avenue.

The Burke Valve Company, Cleveland, placed orders during the week for several tools for machine shop equipment.

The Cleveland office of the Dravo-Doyle Company, merchant engineers, has secured the contract for the turbine and motor driven pumps and a turbine-driven generator, together with switch boards for the new water pumping plant in Akron, Ohio. One 20-in. and one 10-in. pump and one 100-hp. generator will be installed. The equipment will be furnished by the De Laval Steam Turbine Company.

The S. K. Elliott Electric Company, Cleveland, has changed its name to the Vacuum Cleaner Equipment Company.

A new plant for the manufacture of aluminum ware will be established in Massillon, Ohio, by the Aluminum Company, which has been incorporated with a capital stock of $200,000. The company has acquired the Reed glass plant in that city, which was donated by the Massillon Board of Trade. Several of the present frame buildings on the site will be removed and replaced by a modern brick factory building. Some machinery equipment will be required. Frank H. Snyder is president; E. C. Merwin, vice-president; J. V. Miller, secretary and treasurer, and Leon Ward, general manager.

Orders have been placed for new equipment for the municipal water works plant in Ravenna, Ohio. The Cleveland office of the Kerr Turbine Company will furnish a 150-kw. turbine-driven alternator equipped with a C. H. Wheeler Mfg. Company service condenser. Two low head pumps with a capacity of 3,000,000 gal. per day will be furnished by the Wilson-Snyder Centrifugal Pump Company. The Laidlaw-Dunn-Gordon Company will furnish a vertical horizontal cross-compound pumping engine with a capacity of 3,000,000 gal.

The Transue-Williams Company, Alliance, Ohio, has increased its capital stock from $100,000 to $1,000,000, to care for improvements made and contemplated.

The Niles Forge & Mfg. Company, Niles, Ohio, has added to its line of products the manufacture of boiler braces, having recently installed a large motor-driven heading machine for that purpose.

A new ice-making plant will be built in Cuyahoga Falls, Ohio, by Patterson Brothers. The plant will have a daily capacity of 20 tons.

The Thew Automatic Shovel Company, Lorain, Ohio, has just completed two additions to its factory. The machine shop has been extended 85 ft., and an extension of 130 ft. has been made in widening the forge shop, which is now four times its original size. The company has spent about $65,000 in plant extensions and the installation of new machinery. It recently made a shipment of steam shovels to Belgium.

The Brown Clutch Company, Sandusky, Ohio, has completed a plant addition 75 x 200 ft., which will be used for foundry purposes.

The Federal Clay Products Company, Mineral City, Ohio, will shortly place contracts for the erection of a new power plant. Specifications have not yet been completed, but the plant will probably have a capacity of about 1000 hp.

The Willys-Overland Company, Toledo, Ohio, has under way the erection of a new automobile body factory. It will be a two-story brick and concrete building, 200 x 410 ft., and will be equipped with metal working machinery.

The Oxford Pottery Company, Cambridge, Ohio, which was recently incorporated with a capital stock of $50,000, will shortly begin the erection of a 5-kiln pottery plant in that place. Harry W. Dennis is president of the company.

The Fremont Steam Boiler Works, Fremont, Ohio, will erect a new manufacturing building, about 50 x 80 ft.

It is announced that a new automobile and machine shop will be built in Bellaire, Ohio, by Trimble & Johnson, of Moundsville, W. Va.

The Dover Specialty Company, Canal Dover, Ohio, is being formed with a capital stock of $25,000 to establish a plant for the manufacture of a new gasoline sad iron invented by C. L. V. Mundhenk, of Canal Dover. The board of trade of that place is assisting in launching the enterprise.

The Union Brass & Supply Company, Toledo, Ohio, has been incorporated with a capital stock of $25,000 by H. S. Blynt, M. R. Munn, S. W. McClellan and others.

The Donovan Boiler Works, Parkersburg, W. Va., is having plans prepared for a plant addition, 50 x 100 ft. It will be provided with traveling cranes and other machinery equipment.

Cincinnati

CINCINNATI, OHIO, February 9, 1914.

While sentiment relative to the future is somewhat mixed, it is the prevailing belief that an actual turn for the better has been reached in all manufacturing lines. The past week has brought out many inquiries for machine tools from all over the country, but few, if any of these are from railroads. This particular branch of the trade is hardly likely to develop until the freight rate question is definitely settled. Although a few machine tool makers are reported to have plans made for putting on more men, the majority of them are operating with reduced forces, and in some cases, on short time. Continued optimistic reports are given out by manufacturers of small electrical equipment. Ice-making machinery is also in good demand. Business from the South in woodworking equipment is holding up well. There has been some let-up in the call for second-hand machinery.

The French Bros. Bauer Company, Cincinnati, will soon be ready to receive estimates on refrigerating equipment for a 3-story plant. Plans were prepared by the Tait-Nordemeyer Company, St. Louis, Mo. Mention of this project was made some time ago.

An unconfirmed report is circulated to the effect that the Cincinnati Car Company contemplates making further additions to its plant at Winton place. No details are available as to the machinery equipment that will be required in case the rumored plans are carried out.

The C. R. Breuer Smelting & Refining Company, Cincinnati, has been incorporated with $50,000 capital stock, by C. R. Breuer and others. The new company succeeds the Cincinnati Metal Refining Company, operating a brass and copper foundry on Dayton street. It is understood that the company's plant will be enlarged at an early date.

The Gem City Machine Company, Dayton, Ohio, whose plant was recently destroyed by fire, has a new plant in operation on East Fifth street. Practically all the necessary machinery has been purchased.

The Electrolytic Gas Company, Dayton, Ohio, has been incorporated with $5,000 capital stock by E. E. Platt, C. A. Kurz, Jr., and others. It is understood that the new company will establish a plant for the manufacture of hydrogen gas.

Arthur M. Morgan, a Chicago engineer, has obtained contract for installing a waterworks system at Carlisle, Ky., mention of which was made recently.

A mechanical filtration plant will soon be purchased by the city of Zanesville, Ohio. No bids have yet been called for.

The municipality of Celina, Ohio, will open bids February 17 for one 300-hp. boiler to be installed in the waterworks plant.

At a recent meeting of the stockholders of the H. & M. Screw Company, Fostoria, Ohio, it was decided to enlarge the company's plant and install considerable additional machinery. No building plans are yet available.

Donovan's Boiler Works, Parkersburg, W. Va., is now in the market for a 36-in. throat punch, capacity 1 in. through 1 in.; one set of 10-ft. bending rolls; one set of bevel shears and one 40-in. span, 10-ton, hand-power traveling crane. It announces that the new shop will be started up shortly.

The Central South

LOUISVILLE, KY., February 9, 1914.

Although most of the machinery dealers in this section are having a rather satisfactory business, trade seems to be below, rather than above, that of last year. No large contracts are on hand. The prospects are that it will not be long before proposed operations and factory enlargements will be of aid to the machinery and mill supply trade. The greater part of the inquiries just now are for boilers. Electrical machinery is in fair demand.

The Swiss Cleaners & Dyers, Louisville, are preparing to build a factory to cost $50,000, which will require much special machinery, electrically driven. The special equipment will be on the unit plan, each machine having its own motor. Five gas tanks, of a capacity of 1000 gal. each, with pumping machinery for each and a ventilating system will be installed. Dr. H. E. Mechling is manager.

The Vienna Cleaning Company, Louisville, will add carpet-cleaning works to its plant. J. W. Hampston is manager. None of the machinery has been bought as yet.

The Louisville Mill Roll Corrugating Company, 1002 West Main street, John Yenner manager, plans to install a corrugating machine.

George D. Todd, of this city, bought the factory of the American Hame Mfg. Company, New Albany, Ind., and will probably enlarge it later.

M. M. Hancock, proprietor of the Green River Mill, at Sebree, Ky., is planning to install a small ice plant in connection with the mill.

The board of water commissioners, Henderson, Ky., will buy two new boilers, to be installed at the municipal waterworks.

The Campbellsville General Utilities Company, Campbellsville, Ky., will erect a waterworks. I. H. Thurman is president. H. K. Bell, of Lexington, Ky., is the engineer in charge.

The board of public works of Paducah, Ky., is planning to build an electric-light plant, to cost $16,500.

The Pineville Coal Company, Pineville, Ky., which will develop coal property recently bought, will install retarding conveyors, shaker screens, electrical machinery, etc., at a cost of about $100,000. They will call for bids about March 15. White L. Moss, Pineville, Ky., may be addressed.

The Louisville & Nashville Railroad Company will install coaling machinery, consisting of a bucket conveyor, etc., in the yards at Paris, Ky. The system is to have a capacity of 12,500 tons and to coal three engines simultaneously. All arrangements will be made at the office of the chief engineer, Louisville.

The Hazard Light & Power Company, Hazard, Ky., will install $10,000 worth of additional machinery. It has increased its capital stock from $10,000 to $30,000.

The Crystal Ice & Cold Storage Company, Etowah, Tenn., will receive bids until February 16 for refrigerating machinery for a 10-ton ice plant. Power equipment will also be needed. A 7½-ton plant is also under consideration.

The Citizens' Telephone Company, Columbia, Tenn., of which O. H. Porter is general manager, has purchased a site on which to erect a plant.

The municipality of Jackson, Tenn., will issue bonds to the amount of $25,000 for a power-house and electric light system. C. E. Griffin is mayor.

Under the name of the Murfreesboro Machine Works, J. W. Bouchard, of Nashville, has bought the machine shop of S. Hartsfield & Son.

Indianapolis

INDIANAPOLIS, IND., February 9, 1914.

James E. Kepperly, receiver for the Marion Motor Car Company, of this city, has been discharged, after a showing to the court that the affairs of the company were in such shape as to make his services no longer necessary. He was appointed November 3, as a precaution for the protection of the company, which was solvent at the time. The organization was held intact throughout the receivership. J. I. Handley, president, states that the company will now go ahead on a broader basis than ever before. The court's action is taken as an indication of better trade conditions than last fall, especially for the automobile industry. The receiver's report showed the company's assets and holdings were over $800,000.

The United Ice Company is being organized in this city and has been incorporated with $50,000, to build and operate an artificial ice plant in West Indianapolis. The directors are Henry Harmon, B. D. Brooks, William Holland, John F. Ahern and others.

The International Money Machine Company, Indianapolis, has been incorporated with $2,000,000 capital stock, to manufacture coin handling machines. The directors are Charles A. Bookwalter, M. V. Shrader, F. E. Matson, P. E. Muraine and R. D. McCord.

A. R. Kennedy and R. E. Gregg, Merchants Bank Building, Indianapolis, have invented a machine used by the dry-cleaning trade and propose to erect a factory in this city to cost $50,000.

The Hoosier Stove company, Indianapolis, has increased its capital stock from $200,000 to $250,000.

The Pioneer Box Company, Crawfordsville, Ind., has been incorporated with $129,200 capital stock, to manufacture boxes. The directors are H. H. Ristine, G. S. McClure and H. T. Ristine.

The Steel Hub & Forge Company, Connersville, Ind., has been incorporated with capital stock of $40,000, to manufacture steel hubs. The directors are E. W. Ansted, W. B. Ansted and F. D. Bates.

The Hoosier Stove Company, Marion, Ind., has increased its capital stock by an issue of $50,000 preferred.

V. M. Nussbaum & Co., Ft. Wayne, Ind., have been incorporated with a capital stock of $10,000, to manufacture machinery. The directors are V. M. Nussbaum, L. P. Nussbaum and J. W. Thompson.

The Indiana Brass Foundry & Mfg. Company, South Bend, Ind., has increased its capital stock from $10,000 to $15,000.

The People's Fuel Gas Company, Crown Point, Ind., has been incorporated with a capital stock of $25,000, to manufacture artificial gas. Henry P. Broughton is interested.

The Teetor-Hartley Motor Company, Hagerstown, Ind., has been incorporated with a capital stock of $10,000, to manufacture motors. The directors are C. N. Teetor, J. Teetor and H. Teetor.

The city of Bloomington, Ind., is preparing to build a waterworks system at a cost of $200,000 or more and has contracted with a Pittsburgh engineering firm to make the preliminary plans.

The Lawtor Tractor Company, Newcastle, Ind., has been reorganized as the Lawtor Tractor Company of Ohio, with $125,000 capital stock. The plant will be moved to St. Mary's, Ohio, where several citizens have taken stock. Benjamin Lawtor, H. E. Jennings, Charles Jennings and O. O. Carpenter, of Newcastle, retain their interests.

Birmingham

BIRMINGHAM, ALA., February 9, 1914.

January business in the machinery line was a satisfying evidence to dealers that the worst has been passed and that returned confidence and better business conditions are traveling hand in hand. There was a fair demand for boilers, engines and electrically driven apparatus, but the mine and sawmill trades are still stagnant. New factories are calling for supplies of various kinds and general structural operations are more active. There is keen anticipation of a real revival by early summer, at which time railroad building and track-laying are expected to assume considerable proportions in Alabama, Georgia and Mississippi.

The city of Birmingham has begun to supply some of its municipal needs with a small city-owned electric lighting plant and plans for increasing its capacity are under way.

The city of Birmingham is about to close a three-year contract with the Birmingham Railway, Light & Power Company for the use of by-product gas, to be secured by the company from the by-product coke ovens of the Tennessee Company at Ensley.

It is understood that the Gulf States Steel Company, Gadsden, Ala., is contemplating betterments at its open-hearth mill and wire plant.

The Southern Hardwood Lumber Company, Decatur, Ala., has been incorporated by James W. Adair, E. W. Himes, R. M. Lipscomb, and others, for the purpose of cutting and dressing hardwood lumber.

It is reported that the Alabama Power Company proposes to establish a steam electric plant at Decatur, Ala.

W. C. Pilcher will build an electrically driven gin plant at Dothan, Ala.

The Interstate Chemical Company, Macon, Ga., has employed Nisbet & Brown, Macon, to draw plans for a fertilizer factory, to cost about $50,000.

The Tri-County Fertilizer Company, Royston, Ga., has been incorporated with a capital stock of $15,000 by W. C. Mason, G. H. Pruitt and J. F. Roberts. It is proposed to establish a fertilizer factory.

The plant of the Gainesville Roller Mill Company, Gainesville, Ga., has been purchased by J. H. Martin, W. N. Oliver and H. A. Terrell, who will improve and operate it.

The West Coast Fertilizer Company, Tampa, Fla., has been incorporated with a capital stock of $50,000 by J. H. Blake, R. B. Campbell, and others, who will mine phosphate.

The Besser Patent Box Company, Jacksonville, Fla., has been incorporated with a capital stock of $100,000, and will establish a factory for the manufacture of patented cigar boxes, with a weekly capacity of about 10,000 boxes. Jacob Besser, J. A. Rosen and R. L. Hay are interested.

Frank P. Sheldon & Son, Providence, R. I., are preparing plans for the construction of a central power station to supply the cotton mills at Spray, N. C. The plant is to cost $150,000.

St. Louis

ST. LOUIS, MO., February 9, 1914.

Better business is reported from day to day by the machine tool dealers in this territory. They expect increasing activity as the season progresses. Most of the business of the moment is coming from the local industries, which, however, are liberal in the number of tools sought and the general extent of their replacement and extension business. The inquiry from the outlying St. Louis territory is improving and while, as usual at this season, it is not very large, yet it compares favorably with the conditions that have been prevailing. Second hand tool inquiry is fair.

The E. A. Koeneman Electric Company, St. Louis, has been incorporated with a capital stock of $12,000 by E. A. and Charles Koeneman and Henry I. Chaplin and Harry Wibracht, to manufacture electrical machinery and appliances.

The A. F. Nagel Embroidery Works, St. Louis, is establishing a plant at 1605 North Euclid avenue and will install electrically driven machinery, to cost about $7000.

The Continental Boiler & Sheet Iron Works, St. Louis, has been incorporated with a capital stock of $14,000 by George F. Kerwin, John W. O'Brien and Edward G. Borneman, to manufacture boilers, tanks, stacks, etc.

The Southern Illinois Milk Producers, St. Louis, will equip a dairy plant at a location yet to be determined and install machinery, etc. Cyrus Love, Worden, Ill., is president and the capital stock will be $400,000 when the organization is completed.

The Staudte & Rueckholdt Mfg. Company, St. Louis, has increased its capital stock from $40,000 to $60,000 for additions to its factory.

The Dickson Pharmacal Company, St. Louis, has been incorporated with a capital stock of $12,000, by C. K. Dickson Walsh, Thomas M. Pierce and Joseph L. Howell, to manufacture drugs, chemicals, etc.

The Union Cordage & Paper Company, St. Louis, has been incorporated with a capital stock of $25,000, by William, R. W. and K. Knollmann, to manufacture and reclaim cordage, etc.

The Wilder Patents Company and the Wilder Mfg. Company, St. Louis, have been incorporated with capital stock respectively of $10,000 and $100,000 to own, control and manufacture under patented methods, toys and other articles of wood and leather and other fibrous material by machinery of the punch press and die type. The incorporators are Edward B. and Allen B. Wilder, Harry M. Pflagler, Charles W. Glorius, Obed W. Stone and William E. Candy.

The plant of the Acme Tool & Truck Company, St. Louis, has been bought under foreclosure by Lawrence V. Hill, of the Lowell Bank of St. Louis, representing clients who plan improvement of the equipment of the plant and its early operation.

The Standard Oil Company, St. Louis branch, offices in Syndicate Trust Building, has decided upon the immediate construction and equipment of five tank stations, with pumping equipment, etc., in different sections of St. Louis.

The Water, Light & Transit Company, Carrollton, Mo., S. L. Jones, president, will install about $25,000 of equipment in its present plant.

The Bulldog Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $50,000 by W. M. Spencer, E. E. McKee and John M. Cleary, to equip a general manufacturing plant.

The Kansas City Stock Yards Company, Kansas City, Mo., has plans for the expenditure of about $2,000,000 on improvements, including a considerable quantity of mechanical equipment.

The Quality Ice & Cold Storage Company, Kansas City, Mo., which has been incorporated with a capital stock of $50,000 by Alex. Rieger, A. L. Williams and George C. Newland, has bought an existing plant of 60 tons capacity and will enlarge it and also equip a cold storage plant.

The Brand-Dunwoody Milling Company, Joplin, Mo., has completed plans for the erection and equipment of a plant to cost in excess of $150,000.

The McDaniel Milling Company, Carthage, Mo., has completed plans to install electric motors to take the place of its existing power plant.

The Lebanon Elevator Company, Lebanon, Mo., has been incorporated with a capital stock of $15,000 by John A. Elliott, Dean M. Martin and A. T. Elliott and will equip a grain elevator.

The National Mailing Machine Company, Kansas City, Mo., has been incorporated with a capital stock of $500,000, by F. R. S. Ditmars, H. A. Stevens and W. Beck, to manufacture a patented device.

R. B. Howell, secretary of the metropolitan water district, Omaha, Neb., will open bids February 25 for furnishing and erecting a pumping engine of 7000 gal. per min. capacity.

The Texarkana Brick Company, Texarkana, Ark., has been incorporated with a capital stock of $25,000 by George W. and C. W. Fouke and will equip a plant with a daily capacity of 25,000 dry pressed bricks.

The Gay-Streibich Auto Wheel Company, Little Rock, Ark., has been incorporated with a capital stock of $125,000, by George R. Gay, F. O. Rogers and Frank Wittenberg, and will manufacture automobile wheels.

The Arkansas Lime Company, Ruddells, Ark., plans the immediate installation of one 180-kw. direct-current generator with necessary accessory equipment.

A cold press cotton seed oil mill is to be built at Tishomingo, Okla., by George I. Baldwin, of Dallas, Texas, and C. T. Wright, of Celina, Texas, the cost to be about $25,000.

The Bennington Ice, Light & Power Company, Bennington, Okla., has been incorporated with a capital stock of $15,000, by H. C. Clark, W. S. Murphy and J. S. Dawson, to equip a public service company.

The city of Stratford, Okla., has employed the Benham Engineering Company, Oklahoma City, Okla., to prepare plans and supervise the construction of a $35,000 waterworks plant.

The Boardman Company, Oklahoma City, Okla., has increased its capital stock to $125,000 and taken over the plant of the Wylie Mfg. Company, which it will increase in equipment for the manufacture of silos, stacks, etc.

The Atoka Telephone Company, Atoka, Okla., has been incorporated with a capital stock of $11,000, by T. R. Williams, J. N. Roach, W. W. Betts and R. D. Lail, and will equip a telephone exchange and plant.

The Choctaw Cotton Oil Company's press room and machinery room at Ada, Okla., was burned with a loss of $40,000 on equipment. It will be re-established.

The city of Nachitoches, La., will install a 50-kw. generating unit and accessories and also a 10-hp. pumping plant.

The Rhodes Mfg. Company, Shreveport, La., has been incorporated with a capital stock of $10,000 by Hampton P. Rhodes, H. Clay Braud and J. C. Bates and will manufacture metal packing and pulleys.

The city of New Orleans, La., will construct a large incinerator and equip it for the use of the resulting steam in generating power.

The waterworks and sewerage board of New Orleans, La., will receive bids until February 26 for the necessary equipment for a large pumping station now under construction as No. 5.

The Dixie Auto & Welding Company's machine shops at Shreveport, La., has been burned with a loss of $33,000. The equipment will be replaced.

The Louis Werner Stave Company, Shreveport, La., has been incorporated with a capital stock of $500,000 for the operation of a wood-working plant and extension of existing equipment.

The Creston Hoop Company, Alexandria, La., J. M. Peel, president, will equip a plant with a manufacturing capacity of 100,000 hoops daily.

Texas

AUSTIN, TEXAS, February 7, 1914.

There has been no marked change in the machinery and tool trade outlook but a general feeling of optimism continues to prevail. There have been a number of small industrial projects announced during the week, which will require machinery at once.

The City Council, Taylor, has granted a franchise to H. P. Ball, Ann Arbor, Mich., and associates, for the erection and operation of a gas plant. James O'Brien, Milwaukee, Wis., will be manager. Work will be started soon.

The city of Temple will soon begin the work of extending and improving the equipment of the Temple Sanitary Sewer Company, which it has taken over, and $30,000 will be expended on the plant.

The Victoria Safe & Lock Company, Victoria, will increase its capital stock from $40,000 to $100,000 in order to enlarge its factory.

The city of Beaumont has voted to purchase the waterworks plant. A number of improvements will be made to the equipment.

The Graham Mill & Elevator company is erecting a 15-ton ice plant at Graham at a cost of $15,000.

It is announced by President J. F. Strickland, of the Texas Power & Light Company, that a power plant will be erected by the company near Denison, Texas. It is planned to have the plant in operation early in 1916.

The Cartinas Mfg. Company will erect a factory at Crowley, La., to manufacture the Cartinas rivet catcher, a machine that is attached to the bottom of the sucker rods used in pumping oil wells. E. F. Cartinas is president.

The Martin Ice Company, Texarkana, has been organized with a capital stock of $17,500 to erect an ice plant. The incorporators are R. F. Martin, J. H. Slye and J. D. Cook.

The E. B. Hayes Machinery Company, of Marshall, has been formed with a capital stock of $40,000. The incorporators are E. B. Hayes, R. L. Fortson and J. B. Schrett.

San Francisco

SAN FRANCISCO, CAL., February 3, 1914.

Most lines of heavy equipment have done little business beyond the closing of a few transactions that have been pending for a month or more. New inquiries are coming out with greater frequency and in more definite form. A fair volume of orders has been booked for miscellaneous machinery. The local supply of money is still insufficient for all the development work projected. Several important refinancing deals have been completed, permitting large corporations to proceed with the necessary expenditures. The interurban and street railroads are getting into the market for general equipment, and business from the larger roads is expected shortly. Some large sales of mining machinery have already been closed, and contractors' equipment is beginning to move. Lumber conditions are improving, and a few scattering orders for woodworking machinery have been placed. Outside agents for local houses report excellent prospects in all parts of the country, especially with reference to crop conditions.

Marine work has been an important item with local shops lately, owing to storm damage to coastwise shipping, much of the repairs being handled by the United Engineering Works and the Moore & Scott Iron Works. The latter company has also taken a contract for new boilers for the steamer Corcoran, and the Union Iron Works has a contract for an oil tank steamer for the Standard Oil Company, of 9562 tons, and equipped with a 3000-hp. quadruple expansion engine.

The municipal car shop business of this city has been divided between Harron, Rickard & McCone, Manning, Maxwell & Moore, the Eccles & Smith Company and the Pacific Tool & Supply Company.

The Sacramento High School has come out with a good sized list of tools of small but substantial type, covering machine, woodworking and forge shops, alternate bids to be taken on motor and belt drive.

The City Council of San Diego, Cal., is considering the expenditure of $10,000 for garage and machine shop equipment.

It is announced that the Pacific Electric Railway will soon begin the construction of its shops at San Bernardino, Cal.

The Union Tool Company, Los Angeles, has closed a deal by which it secures manufacturing rights for a Diesel type engine, controlled by an English concern. Plans are under way for special equipment for this class of work.

The San Francisco-Oakland Terminal Railways will soon place an order for between 50 and 100 new street cars.

The Keystone Brazing & Welding Company, Los Angeles, has let a contract for the construction of a new machine shop at Clanton and San Pedro streets.

The town of Porterville, Cal., is preparing to issue $15,000 bonds to cover the cost of machinery for an auxiliary water plant.

The Gas Engine & Power Company, New York, has opened an office in the State Bank building, Los Angeles Harbor, for the sale of marine engines.

The Calexico Cotton Gin & Compress Company, Calexico, Cal., has completed arrangements for the construction of a recompressing plant.

It is reported that the Holt Mfg. Company will make some important additions to its plant at Stockton, Cal., this spring.

Henry R. Worthington has taken a contract for a pumping engine for the town of San Bernardino, Cal., at $19,723.

F. M. Thomas is installing a shop for automobile work at Kelseyville, Cal.

The Safety Devices Company, San Francisco, has been incorporated with a capital stock of $250,000, by H. R. Stovel, R. W. Neal, L. V. Bentley, H. L. Bates and J. F. Storey.

The Electric Service Company is preparing to install a $75,000 electric power plant in Coachella Valley, Cal.

The town of Redlands, Cal., is taking bids for a 200-hp. electric motor for the municipal water plant.

The Pacific Coast Specialty Company is preparing to build a factory in Oakland for the manufacture of suction cleaners.

The Pratt-Lowe Preserving Company, Modesto, Cal., is preparing to double its fruit-canning factory.

The Home Ice & Cold Storage Company has been incorporated with a capital of $60,000, to build an ice plant at Long Beach, Cal.

The Globe Mining Machinery Company, Globe, Arizona, has been incorporated with a capital stock of $50,000, by A. F. Williams, F. L. Buchanan and Ray Sach. The company will specialize in the manufacture of crushing machinery.

The Olston Electric Stove Company, H. B. Silvers, president, is installing a factory at Los Angeles.

The Lincoln Motor Truck Company, Los Angeles, has purchased the site of the Globe Iron Works at Sacramento, Cal.

M. R. and R. R. Cone was preparing to equip a shop at Santa Paula, Cal., for the manufacture of walnut-hulling machines.

H. W. Rennick, manager of the Western Switch & Frog Company, Los Angeles, states that the company will build a new factory for railroad specialties near Los Angeles.

The Pacific Northwest

SEATTLE, WASH., February 3, 1914.

Local machinery houses report business fairly good and on the increase to a noticeable extent. The reopening of mills and some few mines has brought forth a number of orders for machinery and tools, and business the past two weeks has been far better than for some time.

The Carlisle-Pennell Lumber Company, William Carlisle, president, the second largest holder of timber lands in the State of Washington, recently announced its intention of building at Centralia, Wash., one of the largest sawmills on the Pacific coast. Preliminary arrangements have been completed and it is understood active operations will begin this month.

The Pacific Tire & Supply Company, Seattle, recently incorporated, will manufacture automobile tires, etc., and states that its factory will be in operation not later than July 1. The company has a capital stock of $700,000 and is controlled by a group of Seattle capitalists, including B. L. Gates, who is treasurer of the company, Austin E. Griffiths and A. K. Allen.

The McCully-Geary Soap Company, Seattle, was recently incorporated with a capital stock of $150,000. M. H. McCully is president and Robert Geary, secretary and treasurer. A factory will be built at once.

The Pacific Iron & Steel Company, Tacoma, has been granted a permit by the building inspector for a smelter to be erected on city property on the Middle Waterway.

The Beaver State Motor Car Company, Lumbermen's Building, Portland, Ore., recently awarded the contract for the construction of a factory in Gresham, Ore. Considerable machinery will be required.

The Farmers' Union Association, Condon, Ore., plans the construction of a 75,000-bu. grain elevator.

The Cedar Cove Sash & Door Company, Vancouver, B. C., will build a $5000 factory at 1100 Sixth avenue West, that city. Machinery is yet to be purchased.

John Seethoff is having plans prepared for the erection of a 200-bbl. flour mill and 40,000-bu. elevator in Metolius, Ore.

The Olympic Handle Company, Union, Wash., has purchased the Blake woodworking plant in that city, and will at once make extensions and improvements, including installation of new machinery. A small sawmill will be installed.

The Portland Lumber Company, Portland, Ore., will make extensions to its sawmill, to cost about $10,000.

The Washington Railway & Electric Company, Tacoma, Wash., has been granted a water power permit authorizing the company to use a site within the Snoqualmie national forest for the erection of a hydroelectric power plant. The project covers the erection of nine separate power houses, etc. Engineers of the forest service estimate the capacity of the combined project at 32,600 hp. Construction of the first unit, according to the contract, must be started by June 1, 1915.

The Stevenson Lumber Company, Seattle, has been formed, with a capitalization of $50,000. D. Johnson and Renfrew Stevenson, 2200 Twelfth avenue, North, Seattle, are the incorporators. It is stated the company plans the construction of a large sawmill.

The Northern Woodenware Company has been formed with headquarters at Tacoma, Wash. John Bagley and Martin Miller, Tacoma, are the incorporators. The company will erect a factory.

The Everett Auto Mfg. Company, Everett, Wash., has been incorporated with a capital stock of $10,000, to erect a small factory.

Bids to be received for waterworks system for Columbus, Mont., have been postponed from February 2 to February 16. G. A. Westover is clerk.

The Rodes Harvester Company, Moscow, Idaho, is planning the establishment of a factory at Lewiston, Idaho.

The Nampa Creamery Company, Nampa, Idaho, is preparing to install an ice plant.

F. J. Phelps, of the American Can Company, has announced that the company would build a factory within the next year at Ogden, Utah, to cost about $250,000.

The Montana Power Company, Great Falls, Mont., has recently filed a mortgage of $75,000,000 to the Guaranty Trust Company, of New York, payable in 40 years. John G. Morony, vice-president of the company, has announced that the company will make extensive improvements to its present plants and will construct new power stations. More than $10,000,000 of the bonds have already been sold, and this amount will at once be utilized in the work now under way and completing the projects at Great Falls of the Missouri River, and Thompson Falls on Clark's Fork of the Columbia River.

Eastern Canada

TORONTO, ONT., February 7, 1914.

The Willys-Overland of Canada, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $500.000 by Francis Watts, John A. Donovan and others, of Toronto, to manufacture automobiles, etc.

The Canadian Sewer Pipe & Clay Product Company, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $150,000 by Lawrence P. Spittal, John H. Slater and others, to manufacture sewer pipe and brick of all kinds.

The Beaver-Acetylene Company, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by John J. McCarthy, William H. Miles and others, to manufacture gas appliances, etc.

The Fox Chain Company, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $200,000 by Thomas Crosthwait, L. H. Gray and others, to manufacture tire chains, etc.

The Litter River Brick & Tile Company, Ltd., Windsor, Ont., has been incorporated with a capital stock of $100,000 by George W. Williams, Edwin Wigle and others, to manufacture brick, tiles, etc.

The Saint Johns Machinery & Tools Company, Ltd.,

St. Johns, Que., has been incorporated with a capital stock of $45,000 by O. Bard, B. Demers and others.

Fire did considerable damage to the grain elevators of the Canadian Pacific Railway, Atlantic Line, Montreal, between 50 and 60 of the conveyors being badly damaged.

H. C. Carrier, Quebec, Que., has rented the shops formerly occupied by the Carrier & Laine Foundry, Levis, and after making extensive repairs will start one of the largest machinery plants in the district.

The Argenteuil Lumber Company, Ltd., Morin Heights, Que., which recently lost its mill by fire, has commenced the erection of an up-to-date saw mill. The equipment will include a steam log loader, nigger, gunshot feed, 8-ft. double cutting band saw, re-saw, double edger, slashers and trimmers. The company is putting in machines for manufacturing clap boards and shingles, as well as planing machines. The plant will be ready and in operation by May 1.

Tenders for the proposed mechnical filtration plant at the Island, Toronto, which is to have a capacity of 60,000,000 gal. per day, were opened by the controllers and referred to the works commissioner. The cost of the undertaking had been estimated at $1,000,000, and the lowest tender received asked $1,096,277 for a concrete or $1,177,054 for a steel filter.

A municipal cold storage plant is contemplated for the city of Toronto, in connection with the abattoir. The cost of the plant will be $36,000.

Good progress is reported in connection with the construction of the large plant of the St. Lawrence Pulp & Lumber Corporation, Pabos Mills, P. Q., now being built by the Aberthaw Construction Company of Boston, and to be finished by next September. There is to be an independent steam turbo-generator plant, giving power for both the pulp mill and a saw mill which is being erected separately. A private railroad is to supply the mill with logs from the extensive timber and pulp wood limits of the company, aggregating some 500 square miles.

Charles Deibel, Hanover, Ont., proposes to erect a factory at Stratford, Ont., 50 x 150 ft., three stories, with engine room, to manufacture furniture frames.

The Producers' Fish Company, Port Stanley, Ont., has decided to erect a suitable building with machinery for a fertilizer plant.

Government Purchases

WASHINGTON, D. C., February 9, 1914.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until February 24, schedule 6351, for a trolley hoist for Brooklyn; schedule 6383, for six 12-in., six 15-in. and six 18-in. 4-jaw, independent, lathe chucks for Norfolk; schedule 6390, for 15 125-volt two speed portable electric drills for Brooklyn; schedule 6382, for two motor-driven wood lathes for Brooklyn; until March 3, schedule 6371, for generators for Canton and Quincy; until March 10, schedule 6374, for a cutting, a ring and circle and a bench shear, and an 8-ft. brake for Puget Sound.

The Isthmian Canal Commission will receive bids until February 21, under circular 826, for four complete sand blast equipments; until February 27, under circular 827, class 1, for 8000 ft. plow steel hoisting cable, and Class 2, 3000 ft. straight link chain.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, February 3, for supplies for the Navy Yards, as follows:

Schedule 6193, Construction and Repair.

Class 31, Brooklyn—One electric spot welder, duty paid—Manning, Maxwell & Moore, $735; Universal Electric Welding Company, $4750.

Schedule 6251, Ordnance.

Class 131, Washington—One 48-in. open-back nailing machine—Morgan Machine Company, $1100.

Class 132, Washington—One belt-driven automatic spindle screw machine—Manning, Maxwell & Moore, $1815; National Acme Mfg. Company, $1700.25; Windsor Machine Company, informal.

Schedule 6253, Construction and Repair.

Class 142, Brooklyn—One two-pressure power-feed acetylene generator—Davis-Bournonville Company, $600; Alexander Milburn Company, $499.

Schedule 6255, Steam Engineering.

Class 151, Brooklyn—One steam-driven air compressor, with spare parts—Ingersoll-Rand Company, $7969.75; International Steam Pump Company, $10,044.85, and $12,400; New London Ship and Engine Company, $25,964, $25,500, $25,200, $25,000 and $26,400.

Schedule 5256, Steam Engineering.

Class 152, Charleston—One 2-ton ice-making and refrigerating outfit—Central Construction & Supply Company, $1192; Chatard & Norris, $1029; Manhattan Supply Company, $1314; United Iron Works Company, $1420.

Bids were received by the general purchasing officer of the Isthmian Canal Commission, Washington, February 3, as follows:

Class 1, Item 1, two duplex 2-stage air compressors, each 2400 cu. ft. capacity—Bid 5, each compressor, $5400; first motor, $5672; second motor, $5284; bid 7, air compressors, $5526 each; motors, $5654 each; bid 19, one compressor $5975; one motor, $5620; two compressors, $5975 each; two motors, $5190 each; alternative bid, one compressor, $6600; one motor, $6410; two compressors, $6600 each; two motors, $6025 each; bid 21, with General Electric equipment, compressors, $5702 each or $6402 each or for certain alterations add $280 to each bid; motors, $5648 each or for one motor and one compressor only, $6058 each; Westinghouse equipment motors, $6081 each for two or for one only, $6664.

Item 2. 1 duplex 2-stage air compressor of 5000 cu. ft. capacity—Bid 5, unit for air compressor, $11,900; unit for motors, $10,390; bid 7, unit air compressor, $9874; unit motors, $7683; bid 19, unit compressors, $9285, unit motors, $8725; bid 21, General Electric equipment unit compressors, $10,332 or $11,332 or add for certain alterations $300 to each bid; motors, $10,812; Westinghouse equipment, one motor only, $12,698.

The names of bidders and the numbers under which they are designated in the above list, are as follows:

5. Bury Compressor Company.
7. Chicago Pneumatic Tool Company.
19. Ingersoll-Rand Company.
21. International Steam Pump Company.

Bids will be received by the Mississippi River Commission, Memphis, Tenn., until February 25, for furnishing 787,000 lb. galvanized wire, silicon bronze wire, wire strand and staples.

The Boardman Company, Oklahoma City, Okla., has increased its capital stock to $125,000 and has taken over all the assets and assumed all liabilities of the Wylie Mfg. Company. The Boardman Company has been manufacturing metal silos, tanks, smoke stacks, etc., while the Wylie Company has been handling bridges, contractors' and road-making machinery and equipment and supplies. The development of the Boardman Company has been rapid, and for various reasons it has been thought desirable to merge the two companies into one, they being managed by the same men and owned by the same stockholders. No change whatever thus occurs in either the management or the stockholders. C. F. Welhener is president; H. G. Stewart, vice-president, and John R. Boardman, secretary and treasurer.

Richard K. Meade, chemical, mechanical and industrial engineer, 202 North Calvert street, Baltimore, Md., has completed plans for a new coal pulverizing plant for the Pennsylvania Salt Mfg. Company, designed to furnish coal for heating nodulizing furnaces. The plans call for a building of steel, 30 x 90 ft., with all stairs, runways and galleries of steel. The equipment will consist of a dryer and two pulverizers, with scales for weighing the coal, elevators, conveyors, etc. All the machinery will be motor driven.

The Laclede Gas Company, St. Louis, has completed the construction and equipment of a series of coke ovens in connection with its existing gas plant and will enter the market with an output from this source of about 1000 tons of coke per day, the by-product gas being utilized in its public service mains. The sales agency for the coke output has been placed with the M. W. Warren Coke Company, St. Louis.

Trade Publications

Air Compressors.—Laidlaw-Dunn-Gordon Company, Cincinnati, Ohio. Information bulletin No. 22. Is one of a series that is being published with a view to distributing among users of compressed air, information of definite engineering value and interest. This one treats of air compressor efficiency and gives a short statement of the factors which control it, with special reference to the Cincinnati air gear. Both volumetric and compression efficiencies are taken up and the results of a number of tests that have been made on compressors of this company are included.

Locomotive Cranes.—Industrial Works, Bay City, Mich. Catalogue No. 108. Does not attempt to describe definitely any machine or the amount of work it will do, but gives suggestions by showing how these cranes are used by various companies. After a brief statement of the progress made in this field, the general and mechanical features of the company's line of locomotive cranes are briefly touched upon, followed by a number of illustrations of the machines in use for handling different classes of material. Mention is also made of lifting magnets and grab buckets for use in connection with the cranes.

Thermit Welding.—Goldschmidt Thermit Company, 90 West street, New York City. Calendar hanger, measuring 7¼ x 14 in. In the upper portion of the hanger is shown a reproduction of the thermit reaction going on in a crucible, while the lower one is given over to a calendar pad. This is arranged by weeks and on each leaf are given views of repairs that have been made by this process. The calendar runs from January 18, 1914, to January 16, 1915, instead of commencing with the first of the year.

Forging Hammer.—Nazel Engineering & Machine Works, 4041 North Fifth street, Philadelphia, Pa. Mailing card. Shows a motor-driven hammer in use in the fitting shop of a locomotive works, where the service is intermittent. The advantages of the hammer for this class of work, as compared with a steam hammer, are briefly touched upon. A testimonial letter is reproduced, which shows the general adaptability of the hammer.

Stationary Pipe Die Heads.—Landis Machine Company, Waynesboro, Pa. Circular. Treats of a stationary pipe die head, which is equipped with six chasers. The head, an illustrated description of which appeared in *The Iron Age*, October 30, 1913, is made in two sizes for handling pipe ranging from 2½ to 8 in. in diameter. An engraving of the head is given, together with a condensed table of specifications and a chart showing the information that is required where the heads are to be attached to different standard machines.

Wires and Cables.—Simplex Wire & Cable Company, 201 Devonshire street, Boston, Mass. Pamphlet. Size, 4¼ x 6¾ in.; pages, 92. Contains numerous tables and other information of all kinds about insulated conductors and bare wire. A condensed table of logarithms is given, together with miscellaneous data, all of which is rendered easy of finding by a complete index.

Engine Lathes.—Cincinnati Iron & Steel Company, Cincinnati, Ohio. Folder. Relates to a line of engine lathes which are built with swings of 14, 16 and 18 in. A brief description of the lathes in general is given, followed by tables of dimensions and specifications for the three sizes. A view of the tool with the various special features indicated by a set of arrows is also given. An illustrated description of the 16-in. lathe appeared in *The Iron Age*, May 1, 1913.

Fire Brick.—Pyro Clay Products Company, Oak Hill, Ohio. Tables of useful information. These include the melting points and working temperatures of various metals, together with tables of the numbers of bricks of different types required for various diameters of circular linings.

Inclosed Arc Lamps.—Dyer Flaming Arc Company, Philadelphia, Pa. Folder. Describes an inclosed flame arc lamp for use wherever large areas are to be illuminated. The operation of these lamps, together with their mechanism is described at some length. Views are given of both the alternating and direct current lamps, showing the mechanism.

Steel Hardness Tester.—Wheelock, Lovejoy & Co., 23 Cliff street, New York City. Folder. Shows an impact ball tester for determining the softness of steels. The use of this device, in which a hardened steel ball is driven by a weight into the piece of steel to be tested, is touched upon, and the special features of indestructibility, efficiency and portability are pointed out.

Forge Furnaces.—W. S. Rockwell Company, 50 Church street, New York City. Bulletin No. 21. Calls attention to a line of forge furnaces with a special economizer shield over the working opening which recovers a large percentage of the heat ordinarily lost and at the same time affords protection to the operator. The exhaust gases discharged from working openings are deflected by an air blast away from the operator and against the economizer, through which the air for combustion is circulated, thus enabling the air to take up heat in its passage and be delivered hot into the furnace with the fuel. The special advantages claimed for this arrangement are a reduction in fuel, protection for the operator, increased output, restricting the discharge of waste gases, the reduction of scale and an increase in the life of the dies. Exterior and sectional views of the furnace, which can be built in various widths and depths and with openings at one or both ends are given. The furnace is designed for the use of either oil, gas or powdered coal in connection with a low-pressure air blast.

Core Making Machines.—Diamond Clamp & Flask Company, Richmond, Ind. Folder and circular. The former gives general description and specifications for a jolt ramming core making machine which is operated by hand, belt power or compressed air. This machine uses the core box system and will make a standard round core ranging from ⅝ to 3½ in. in diameter at the rate of 150 to 200 ft. per hr. It is also possible to make 100 cores ½ in. in diameter and 1 in. long in 1 min. One of the principal features of the machine is the self-feed hopper, a set of three or more being provided for different sizes of cores. A description of the operation of the machine is given, together with a list of other foundry supplies, such as flasks, clamps, core boxes, wedges, etc. The circular points out the advantage of using a plunger type core machine for making either stock or irregular shaped cores. The special feature of this machine is the use of a positive feed hopper and a swiper feed, the latter taking the sand from the bottom of the mixer and rolling it into the dies. A view of the machine and a section illustrating the action of the feed are given.

Drilling Machines.—Richmond Stay-Bolt Drilling Machine Mfg. Company, Richmond, Va. Two circulars. One of these relates to a 12-spindle, semi-automatic staybolt drilling machine and the other to a six-spindle drilling machine, the maximum size of drill handled by each being ⅝ in. Views of both machines are given, together with sets of engravings showing some of the work accomplished by each.

Pyrometers.—Stupakoff Laboratories, Pittsburgh, Pa. Pamphlet, entitled "Pyrometer Facts." After defining the pyrometer, the various types made are illustrated and briefly described. These include a wall type galvanometer, a shelf type and portable test galvanometer, recording and portable pyrometers and platinum-rhodium and base metal thermocouples. A water jacket for maintaining a uniform temperature at the cold junction is also illustrated and briefly described.

Special Machinery and Fabricated Iron and Steel.—Atkinson-Frizelle Company, Foot of Seventh street, Hoboken, N. J. Memorandum book. Contains a short account of the history of the company, together with a list of the various classes of work which it is prepared to handle. These include the design, building and erection of plate and structural steel tanks, hoppers, chutes, etc.; special machinery for drilling, dredging, excavating, hoisting and conveying; the supplying of hammered forgings, the repairing of engines and boilers and oxy-acetylene cutting and welding work. In addition to the customary places for memoranda the usual amount of information is included.

Electrical Drilling and Grinding Machines.—United States Electrical Tool Company, Cincinnati, Ohio. Folder and circular. The illustrations in the folder give an idea of the many ways in which portable electric drilling and grinding machines can be used, together with views of the machines themselves. The line includes a number of portable types and one bench machine having a capacity of ½ in. in metal. The grinding machines include internal, bench and center styles. The circular features a universal machine equipped with a motor for operating either direct or alternating current circuits with a voltage of 110. Particular attention is directed to the new type of switch with which these machines are equipped.

Safety Lathe Dog.—Oneida National Chuck Company, Oneida, N. Y. Folder. Describes a safety lathe dog which was illustrated in *The Iron Age*, October 2, 1913. The dog can be used for holding round, square or flat stock and the jaws with the adjusting screws and the springs for opening the jaws are all inclosed in a circular steel guard, which has a smooth face and rim.

Grinding Machines.—Diamond Machine Company, Providence, R. I. Catalogue. Relates to a machine designed for heavy face and guide bar grinding which was illustrated in *The Iron Age*, September 25, 1913. Among its features is a system of control by which the operator has complete command, whether in front or at the side. When two machines are in service, they are usually placed back to back, so that one man can control the two. Carefully worked out lubrication and water arrangements are illustrated and described. The machine is arranged for belt or inclosed geared motor drive. Safety features have received special attention.

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